DOCUMENT RESUME

ED 236 375 CE 037 431

AUTHOR	Bishop, John H.
TITLE	The Social Payoff for Occupationally Specific Training: The Employers' Point of View. Technical Report and Executive Summary. Studies in Employment and Training Policy: No. 3.
INSTITUTION	Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	Nov 82
GRANT	NIE-G-81-0022
NOTE	113p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	*Employer Attitudes; *Employment Qualifications; *Entry Workers; Inplant Programs; Job Skills; Occupational Information; *On the Job Training; Postsecondary Education; *Relevance (Education); Secondary Education; Surveys; *Vocational Education; Work Experience
IDENTIFIERS	Employer Surveys

ABSTRACT

Data from a survey funded by the National Institute of Education involving 3,847 employers were analyzed to examine the relationship between school-provided vocational education and employer-provided on-the-job training. Employers reported that school-provided vocational training was required for 9.5 percent of the jobs studied and "important but not required" for another 37.9 percent. School-provided vocational training seemed complementary with on-the-job training. Jobs that have school-provided vocational training as a prerequisite for hiring offered newly hired workers greater amounts of on-the-job training. A comparison of occupants of the same job at the same firm showed that new hires with relevant school-provided vocational training required about 7 percent less on-the-job training and were significantly more productive than new hires with no training. New hires with a good deal of relevant job experience took less time to train and had higher productivity indexes than those with none. On-the-job training created externalities--social benefits not captured by the trainer or trainee. (Appendixes, amounting to approximately two-thirds of the report, include alternative measures of the impact of occupationally specific training and the Gallup organization's report on survey procedures and the survey instrument.) (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED236375

THE SOCIAL PAYOFF FOR OCCUPATIONALLY SPECIFIC TRAINING: THE EMPLOYERS' POINT OF VIEW

Technical Report and Executive Summary

Studies in Employment and Training Policy: No. 3

by

John H. Bishop

The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

November 1982

CE037431

THE NATIONAL CENTER MISSION STATEMENT

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Providing information for national planning and policy
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

For further information contact:

Program Information Office
National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

Telephone: (614) 486-3655 or (800) 848-4815
Cable: CTVOCEDOSU/Columbus, Ohio
Telex: 8104821894

FUNDING INFORMATION

Project Title:	Employer Survey
Grant Number:	NIE-G-81-0022, P-11
Project Number:	714284
Education Act under Which the Funds Were Administered:	P.L. 96-88
Source of Contract:	U.S. Department of Education National Institute of Education Washington, DC
Project Officer:	Warren Simmons
Contractor:	The National Center for Research in Vocational Education The Ohio State University Columbus, Ohio
Executive Director:	Robert E. Taylor
Project Director:	John H. Bishop
Disclaimer:	This publication was prepared pursuant to a contract with the National Institute of Education, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination Prohibited:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." The Employer Survey Study, like every program or activity receiving financial assistance from the U.S. Department of Education must comply with these laws.

TABLE OF CONTENTS

	Page
LIST OF TABLES	v
FOREWORD	vii
EXECUTIVE SUMMARY	ix
1. INTRODUCTION	1
1.1 Employer-provided Training	1
1.2 School-based Education and Training	3
2. THE DETERMINANTS OF THE LEVEL OF ON-THE-JOB TRAINING	5
3. DOES SCHOOL-PROVIDED VOCATIONAL EDUCATION BENEFIT EMPLOYERS?	12
3.1 Theory	12
3.2 Testing for Employer Benefits	15
3.3 The Effects of Establishment Size on the Payoff to Previous Training or Experience	22
3.4 The Payoff to Previous Training or Experience by Occupation	24
4. CONCLUSIONS AND POLICY RECOMMENDATIONS	26
APPENDIX A: ALTERNATIVE MEASURES OF THE IMPACT OF OCCUPATIONALLY SPECIFIC TRAINING	33
APPENDIX B: THE GALLUP ORGANIZATION'S REPORT ON SURVEY PROCEDURES	45
APPENDIX C: THE GALLUP ORGANIZATION'S SURVEY INSTRUMENT	59
REFERENCES	105

LIST OF TABLES

		Page
1.	THE RELATIONSHIP BETWEEN REQUIRING VOCATIONAL EDUCATION AND THE AMOUNT OF ON-THE-JOB TRAINING	6
2.	OCCUPATION AND THE COST OF TRAINING A WORKER	8
3.	THE RELATIONSHIP OF COST OF TRAINING A WORKER TO ESTABLISHMENT SIZE	11
4.	THE IMPACT OF GROWTH ON THE COST OF TRAINING A WORKER	11
5.	IMPACT OF VOCATIONAL EDUCATION ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES	17
6.	EFFECT OF YEARS OF PREVIOUS RELEVANT JOB EXPERIENCE ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES	21
7.	EFFECT OF RELEVANT VOCATIONAL EDUCATION ON TRAINING COSTS REPORTED PRODUCTIVITY AND WAGE RATES BY ESTABLISHMENT SIZE.	22
8.	EFFECT OF FIVE YEARS OF PREVIOUS RELEVANT WORK EXPERIENCE ON TRAINING COST, REPORTED PRODUCTIVITY, BY ESTABLISHMENT SIZE AND WAGE RATES	24
9.	THE EFFECT OF RELEVANT VOCATIONAL EDUCATION ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES FOR DIFFERENT OCCUPATIONS	25
10.	THE EFFECT OF FIVE YEARS OF PREVIOUS RELEVANT WORK EXPERIENCE ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES FOR DIFFERENT OCCUPATIONS	26
A-1.	EXTRA ON-THE-JOB TRAINING BY VOCATIONAL EDUCATION BACKGROUND OF NEW HIRE	38
A-2.	EXTRA ON-THE-JOB TRAINING BY VOCATIONAL EDUCATION AND PREVIOUS JOB EXPERIENCE OF NEW HIRE	39
A-3.	EXTRA FORMAL ON-THE-JOB TRAINING BY AMOUNT AND RELEVANCE OF VOCATIONAL EDUCATION OF THE NEW HIRE	40
A-4.	PRODUCTIVITY INDEX DIFFERENTIAL BY INSTITUTION PROVIDING THE VOCATIONAL EDUCATION	41
A-5.	PRODUCTIVITY INDEX DIFFERENTIAL BY RELATEDNESS OF VOCATIONAL EDUCATION TO THE JOB	42
A-6.	PRODUCTIVITY INDEX DIFFERENTIAL IN THE FIRST TWO WEEKS BY AMOUNT OF VOCATIONAL EDUCATION	43
A-7.	PRODUCTIVITY INDEX DIFFERENTIAL IN THE SECOND TEN WEEKS BY AMOUNT OF VOCATIONAL EDUCATION	44

FOREWORD

Very little is known about the magnitude and character of employer-provided on-the-job training and how the need for this training is affected by the availability of school-provided vocational education. To address these and other issues, the National Center for Research in Vocation Education commissioned the Gallup Organization to conduct telephone interviews with over 3,500 employers. This paper is the first of a series of papers analyzing these data. Future work will refine and elaborate on the models presented in this paper and explore the impact of other employer and employee characteristics on employer-provided training and the productivity of new employees.

This research would not have been possible without the cooperation and assistance of 3,500 employers who so graciously responded to our telephone interview. We greatly appreciate the time and the insights that these very busy men and women contributed to the study.

The project is also indebted to the many employers who assisted in the design of the interview instrument. In this regard, special thanks are due to Jim Medoff, Harvard University; Frank Stafford, Chairman of the Department of Economics, University of Michigan; Clifford Roe, Supervisor of Salaried Union Relations and EEO Administrator (retired), Buffalo Divisions, Westinghouse Electric Corporation; and William J. Dennis, Research Director, National Federation of Independent Business. Wilson S. Johnson, President of the National Federation of Independent Business, was very supportive of the study and graciously provided a letter of introduction that we sent to all the employers selected for an interview.

We wish to express our gratitude to the National Institute of Education for sponsoring this study and to Warren Simmons, who served as project officer, for his guidance and support. We want to thank the members of the National Center Research Division's advisory committee for their suggestions in the development and execution of the study. The committee consists of Howard Rosen, Chairperson; William Brooks, General Motors; Jose Cardenas, Intercultural Developmental Research Association; David Clark, Indiana University; Ellen Greenberger, University of California, Irvine; Charles Knapp, Tulane University; Marion Pines, Mayor's Office of Manpower Resources, Baltimore; Peter Rossi, University of Massachusetts; Beatrice Reubens, Columbia University; Henrietta Schwartz, San Francisco State University; and Lana Wertz, Aetna Life and Casualty.

Thanks are extended to the staff at the Gallup Organization, who supervised the telephone survey: Mitchell Cohen, Nancy Nygreen, Peggy Ashton, and Corine Kyle. Terrence Davey did the programming and database preparation; the manuscript was edited by Janet Kiplinger and typed by Vera Mueller and Cathy Jones.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

This paper examines the relationship between the two major forms of occupationally specific education and training--school-provided vocational education and employer-provided on-the-job training. It addresses three specific questions:

- What determines the amount of on-the-job training typically offered to new hires for the job? Do jobs that require school-provided vocational training tend to offer more or less on-the-job training?

- Holding constant the job and the firm, what association does the previous school-provided vocational education or relevant work experience of a new hire have with his/her reported productivity, training time, and wage rate?

- Do firms receive benefits from hiring already-trained workers--greater productivity and reduced training costs--that outweigh the higher wages they pay these new hires?

The data that have been analyzed are from a national survey of employers that was funded out of an institutional grant from the National Institute of Education to the National Center for Research in Vocational Education. The survey was a reinterview of the employers who responded to a survey funded by the U.S. Department of Labor in the summer of 1980.

This survey of 3,847 employers obtained a great deal of detailed data on the amount and nature of employer-provided training for specific, recently hired individuals. Employers reported that school-provided vocational training was required for 9.5 percent of the jobs studied, and "important but not required" for another 37.9 percent of jobs. When different jobs are compared, school-provided vocational training seems to be complementary with employer-provided, on-the-job training. Jobs that have school-provided vocational training as a prerequisite for hiring offer newly hired workers greater amounts of on-the-job training. On-the-job training is also greater in jobs that require more general education and that expect the worker to direct the work of others.

A proxy measure of the reduced productivity of the newly hired worker during the training period was obtained by asking the new workers' supervisors to compare and then rate the relative productivity of the new hires at three different points in their tenure at the firm: during the first two weeks of employment, during the next ten weeks, and at the time of the interview six or more months later. Firms that <u>for the same job</u> had hired workers <u>with</u> and <u>without</u> previous school-based vocational training were asked the same sequence of questions about both workers. The comparison of the answers for the two different occupants of the same job can tell us whether new hires with school-based vocational training required less supervision and training time during the first three months at the firm and whether their supervisor saw them as more productive both initially and after six or more months at the firm.

Once the job and employer are specified, there is a limited degree of substitutability between the two types of training. When comparing occupants of the same job at the same firm, we found that new hires with relevant school-provided vocational training required a statistically significant 18 percent lower amount of on-the-job training.

Employers reported that the occupants of a job with relevant school-provided vocational training were significantly more productive than the occupants of that job that lacked such training. The productivity index was a statistically significant 9 percent higher in the first two weeks and 6 to 7 percent higher, thereafter. Wage rates were higher as well. During the first three months, training cost reductions of 7.5 percent of the output of a worker with two years of tenure seem to be achieved. The training cost reduction is significantly greater than the increment in starting wage rates that a person with relevant vocational background is able to obtain. All of the effects described above are largest in small establishments.

The finding that new employees who have relevant school-provided vocational training are less costly to train (but not much more costly to employ) than the other employees hired by the firm in the same job implies that there are hidden benefits of vocational education that are not being measured by traditional studies of the returns to vocational education. Vocational training benefits society in three ways: by raising the wage rates and earnings of the people who receive school-provided vocational education, by lowering the wage rates of certain types of skilled and semiskilled jobs (therefore lowering the prices of the products produced by firms that employ these workers), and by providing hidden externality benefits to firms that hire trained workers. Our study is the first to provide evidence of this third effect.

Other important policy implications of our data analysis derive from the finding that a vocationally trained worker's reported productivity is higher and training costs lower only when the job he/she has obtained makes use of the training received. Daymont and Rumberger (1982) and Campbell et al. (1981) have obtained similar results in analyzing the New Youth Cohort of the National Longitudinal Survey. Compared to those with a general education, those who took high school vocational education courses earned more when their jobs were related to their training and earned less when their jobs were not related to their training. These findings tend to suggest that vocational training programs should strive to obtain high training-related placement rates.

Another major finding of the study is that new hires with a good deal of relevant job experience prior to being hired take less time to train and have higher productivity indexes than new hires for the same job who have no such job experience. These differences are both statistically and substantively significant. Compared to those with no experience, new hires with five years of relevant job experience tend to have productivity indexes that are 16 percent higher in the first two weeks, 11 percent higher in the next ten weeks, and 6 percent higher after six to twenty-four months. Those with more than ten years of relevant job experience have productivity indexes that are 28, 19, and 11 percent higher, respectively. Required training time is reduced

as well. In our sample the new employee with five years of experience received about five fewer hours of formal OJT and about twenty-three fewer hours of informal OJT than a new hire with no previous experience. Five years of experience reduces the training time index by about 22 percent. When the effects on productivity and training time are combined, the data imply that hiring a worker with at least five years of relevant job experience rather than one with no experience saves the firm during the first three months resources equivalent to 16 percent of the output of a worker with two years tenure. Starting wage rates are only 8 percent higher for workers with five years of experience, so the firm benefits (receives a quasi rent) when it hires an experienced employee. The productivity advantage of those with previous relevant experience continues into the second and third years at the firm, but it diminishes enough so that productivity effects and wage effects become roughly equal.

Our findings about productivity, training time, and wage rates imply that on-the-job training by employer A not only benefits the employee and employer A (as implied by Becker's theory of on-the-job training) but also benefits other employers in the industry who hire workers who quit or are laid off by employer A. In other words, OJT creates externalities--social benefits that are not captured by either the trainer or the trainee. As in the case of vocational training, a market failure exists and the justification for government subsidy of the externality creating activity is strengthed.

When calculating the social benefits of vocational training or of on-the-job training/work experience, these externalities should be added to conventionally measured benefits derived by comparing the earnings of workers who have received the training to the earnings of comparable individuals who have not received it. While the externalities we have identified are substantively important, they are not likely to be large enough by themselves to cause benefit-cost ratios to be greater than one unless the incremental cost of vocational education is very small. A rough estimate of the size of the externality is 5 percent of three months' wages for relevant vocational training and 8 percent of three months' wages for five years of relevant job experience. The evidence for the existence of an externality relates only to the first three months. We have no measures of time inputs into training beyond the first three months and our data on differentials in reported productivity and wage rates six to twenty-four months after being hired are consistent with a hypothesis of no continuing externalities. Five percent of three months' wages is 1.25 percent of a year's wage. An upper bound estimate of the size of the externality, 2.75 percent of a year's wage, is obtained by assuming that 60 percent of the individuals' jobs are relevant to training and are at firms that also hire those without vocational training, that the beneficial impact of training does not diminish, that job changes occur regularly every three years, and that the real discount rate is 10 percent. These point estimates of the size of the hidden externalities can be calculated only by making rather strong assumptions about the valuation of the time inputs of trainers and the scaling of our productivity index and so must be treated with caution.

Regardless of the size of such a hidden externality, the socially optimal amount of occupationally specific training will not be provided unless the

employer, the employee, and the public all share in its costs. For a number of reasons (e.g., minimum wage, immediate needs for income, lack of foresight, discrimination) employees are often unable or unwilling to pay a large enough share of the costs of training (by accepting low wage rates early in their job tenure) to make it profitable for the employer to provide the optimal amounts of on-the-job training.

Currently, school-based occupational training receives public subsidy, while employer-provided training does not. The differential availability of subsidies may have resulted in schools' offering types of occupational training that might better be obtained as part of a job. It may be that expansion of employer training would yield an exceptionally large social payoff. Methods of promoting and/or subsidizing employer-provided training are not easy to devise, however, and research needs to be directed at exploring a variety of alternatives.

1. INTRODUCTION

All educational and training activities--whether located in a school or on the job--generate some social benefits that are not necessarily received by the student/trainee or by the organization doing the training. People who have received considerable education and training benefit others in society by paying higher taxes, by being less likely to require welfare payments or unemployment compensation, by being less likely to commit crime, by being more likely to give time and money to charity, by being less likely to experience long periods of hospitalization that are paid for by insurance or government, by being more likely to make scientific discoveries or artistic contributions that benefit others in the society, and in many other ways (Haveman and Wolfe 1982). Economists call the social benefits such as these "spillovers" or "externalities."

When deciding on the type and amount of education and training to undertake, however, most individuals do not take such benefits into account. Their motivations for obtaining education and training are the private benefits such schooling experience confers: the enjoyment derived from being a student, the higher after-tax income, the prestige and consumption benefits of having an education, the private benefits of improved health, and so forth. Since these private benefits account for only part of the total benefits to society of education and training, private decisions will lead to too little education and training being undertaken unless public agencies intervene and partially subsidize the cost. The amount of public subsidy that is appropriate is closely related to the size of the spillover or externalitity benefits of education and training. The case for public subsidy of schooling has been made many times (Cohn 1979; Hartman 1973; Mundel 1973). Public provision of education and training (i.e., public schools, occupational skill training) is not, however, the only or necessarily the most efficient institutional arrangement for ensuring that the socially optimal amount, nature, and quality of education and training are undertaken. Privately controlled secondary and postsecondary institutions are an important alternative to publicly controlled institutions, although they are not the only ones.

1.1 Employer-provided Training

Many of the competencies that make one a productive worker are more easily learned on a job than in a classroom. Examples of skills that are best learned at a job are how to operate a specific type of equipment and how to adjust to the nine-to-five work routines of an office or factory. Since those who receive on-the-job training (OJT) earn higher incomes, and consequently pay more taxes, receive less welfare, and commit fewer crimes and so forth, a case can be made for public subsidy of OJT. Typically, the employer has effective control over how much training is provided on the job. Much of what is learned is useful at more than one firm, however, so employers who invest in this training often end up subsidizing their competition because many of the employees they train eventually leave to work for neighboring firms (e.g., a secretary trained on a IBM Displaywriter might go to another firm that uses Displaywriters).

Becker (1975) suggests that how the costs and benefits of on-the-job training are shared between employer and employee depends upon the extent to which on-the-job training is general rather than firm specific. Firm specific training raises the worker's productivity in the organization that provides the training, but cannot be applied in other organizations. The outcome of specific training might be knowing how to operate a particular piece of machinery in a way that avoids breakdowns, knowing where to find things in the plant, learning who to ask for advice about particular matters, and learning how to satisfy one's supervisor's idiosyncracies.

General training raises a worker's ability to be productive in other organizations as well as the one providing the training. General training includes activities such as: learning how to operate or repair a type of machine used by many organizations, learning how to read a blueprint, and developing good work habits--punctuality, reliability, self-discipline, ability to work as part of a team--that are important for success in any job.

The nature of current training (whether it is general or firm specific) and the time patterns of the training costs influence the amount and time pattern of the wage paid the worker and the distribution of the costs and benefits of training among employers and workers. As the generally trained workers become more productive, the firm will be forced to raise its wage to keep them. Since the workers, not the firm, get the benefits of the training, a firm will not be able to bear any of the training cost without reducing profits. Thus, in Becker's model the competitive firm that provides only general training will offer during the training period a wage equal to the value of the marginal product of the worker, minus the cost of the training. Some workers will volunteer to work during training at this wage, even if it is below what could be earned elsewhere without the training, because it will mean a higher wage later.

Becker's theory of OJT training predicts that the costs and the benefits of providing specific training are shared by the employees and their employer. Workers who are specifically trained will not be offered comparable wages by other firms because the productivity of the specifically trained worker will be higher in the firm in which specific training is received than it is in another firm. Therefore, firms offering this type of training can recover part of this training cost by offering trained workers a posttraining salary lower than their marginal product in that firm, but higher than their (current or future) marginal product elsewhere. The employees' contribution to the costs of general and specific training is the difference between their wage during training and the wage they could obtain in a job that offered no training opportunities. We can measure the amount of OJT training that is paid for by employees by estimating how much and how quickly both wages and productivity rise with tenure at the firm.

The employer's contribution to the costs of specific training consists of the productivity lost by other workers who orient and train new workers and the difference between the wage paid the new employee and his/her productivity during the training period. The employer may eventually be compensated for incurring these costs by an increase in the workers' marginal product above the real wage in the posttraining period.

1.2 School-based Education and Training

Schools and colleges are and will remain the dominant preparers of our nation's youth for the labor market. Employers have a considerable interest in the nature and quality of the education (both basic and vocational) that schools and colleges provide. If a school leaver cannot read an instruction booklet, an experienced worker must be taken off the production line and asked to teach the new employee the job one-on-one. This raises the employer's costs and reduces the productivity of the work force. A school leaver who has received instruction on the kinds of machines an employer uses is immediately productive. The employer profits, and productivity is improved. Thus, formal vocational education that is relevant to a job can reduce training costs and/or increase productivity by substituting for general on-the-job training or by facilitating either general or specific OJT. Some of the benefits of a good education or a quality training program accrue to the worker because employers compete for the school leavers they believe to be most qualified. Various imperfections of the market and the possibility that some of the training may be specific to a very small number of employers, however, may prevent the worker from receiving all of the benefits of his/her education and training. Some of the benefits may accrue to the employer.

The conventional way of measuring the benefits of training compares the earnings of training program graduates to the earnings of a (preferably randomly assigned) control group of similar individuals who have not been trained. If factor and product markets are competitive and wages adjust up and down to equilibrate demands and supplies for each occupational and skill group, both trained and untrained workers will be paid exactly what they contribute to the firm--what an economist calls their marginal value product. If there are no externalities, earnings differentials measured by the conventional approach will be equal to the social benefits of training. However, when labor markets are imperfectly competitive, the neat correspondence between wage differentials and social benefits breaks down. Johnson (1982) and Gustman and Steinmeier (1982) have shown how the existence of a minimum wage can, under some circumstances, make the social payoff of training much greater than the measured wage differential. Bishop (1978) has shown that the distortion of the labor market created by unions causes individuals to underestimate the true social return to college by about 10 percent.

Okun (1981), Williamson, Wachter, and Harris (1975), and others have pointed out that the relationship between employers and their permanent employees has many elements of bilateral monopoly. The implicit and explicit contracts that regulate pay and work rules often make adjustments to new economic environments by the firm more costly. Incompetent workers become difficult to fire, and relative wage rates become difficult to change. Promotion ladders and relative wages are designed with both incentives (to reduce shirking) and productivity in mind. The internal labor market that develops allocates labor bureaucratically rather than by adjustments in relative wages. Under these circumstances, it is not common for some groups of workers to be paid significantly less than they are worth and for others to be paid significantly more (Medoff and Abraham 1981).

The statement that an occupation is experiencing a shortage indicates that the value of the marginal product of these workers is greater than their wage. When such a shortage occurs, the firm responds by offering bounties to persons who recruit new employees, by paying search firms large bonuses to find new employees, by lowering minimum hiring standards, and by training and upgrading untrained workers. (The "bounty" practice is illustrated in the Wall Street Journal's 14 July 1982 article on the Loral Corporation--a firm that was offering a $5,000 bonus to employees who recruited engineers with four years of experience.) Thus a school-based program that trains people for a "shortage" occupation benefits employers of the trainee as well as the trainee because the employer's recruitment and training costs are reduced. This potential benefit of vocational education has been ignored by the benefit-cost studies of employability development programs that have been done to date. This interim report is the first study to explore that potential benefit.

This interim report on the status of the Employer Survey analysis will address three issues:

- What determines the amount of on-the-job training typically offered to new hires for a job? Do jobs that require school-provided vocational training tend to include more or less on-the-job training?

- Holding constant the job and the firm, what association does the previous school-provided vocational education or relevant work experience of a new hire have with his/her reported productivity, training time, and wage rate?

- Do firms receive benefits from hiring already trained workers--greater productivity and reduced training costs--that outweigh the higher wages they pay these new hires?

The data that have been analyzed are from a national survey of employers conducted during the spring and summer of 1982 that was funded out of an institutional grant from the National Institute of Education to the National Center for Research in Vocational Education. The survey was a reinterview of a sample of the employers who responded to a survey funded by the U.S. Department of Labor in the summer of 1980.

The Gallup Organization conducted this survey under a contract with the National Center for Research in Vocational Education. A copy of the relevant portion of this survey is included as appendix C. A description of Gallup's data collection procedures is included as appendix B. A total of 3,847 interviews were completed in the wave-2 survey. Not all firms answered the necessary questions, so the data pertaining to the employment experiences of newly hired employees were assembled for approximately 3,500 employees.

The second wave of the Employer Survey obtained a great deal of detailed data on the amount and nature of employer-provided training. Formal training programs run by specialized training personnel were distinguished from informal on-the-job training. The time inputs of the new hire were distinguished

from the time inputs of other staff. A proxy measure of the reduced productivity of the newly hired worker during the training period was obtained by asking the new workers' supervisors to compare and then rate the relative productivity of the new hires at three different points in their tenure at the firm: during the first two weeks of employment, during the next ten weeks, and at the time of the interview six or more months later. These were compared to the productivity rating given the average experienced worker who had been in that job for two years.

The employer benefits of vocational training can be measured by comparing the training costs and reported productivity levels of recently hired, vocationally trained employees to the training costs and reported productivity levels of untrained new employees in the same job. Firms that, for the same job, have hired workers with and without previous school-based vocational training were asked the same sequence of questions about both workers. The comparison of the answers for the two different occupants of the same job can tell us whether new hires with school-based vocational training required less supervision and training time during the first three months at the firm and whether their supervisors saw them as more productive both initially and after six or more months at the firm. Never before has such a comprehensive set of questions about hiring and training costs been asked of a large national sample of employers.

The analysis of Employer Survey data presented in this paper is divided into two sections. The first section examines the impact of the characteristics of the firm and job on the amount of training received by the typical new employee. The second section examines whether, when the job is held constant, variations in the amount of previous vocational education and work experience are related to variations in the reported productivity of a new worker, the amount of training he/she requires, and the wage rate that is offered.

2. THE DETERMINANTS OF THE LEVEL OF ON-THE-JOB TRAINING

The primary determinant of the amount of on-the-job training that a new employee gets is the job he/she is entering. In this section of the paper we will examine the impact of two characteristics of the job--occupation and the amount of school-provided vocational training required by the employer when hiring for this job--on the amount of OJT the new employee receives. We will also examine the impact of two characteristics of the establishment--its size and rate of growth--on the amount of OJT.

Let us begin by examining the relationship between the reported importance of previous school-provided vocational training when selecting new employees and the amount and success of employer-provided on-the-job training. The question about the importance of vocational education was worded as follows: "When interviewing applicants for this position, how important is the previous school-provided vocational training in your hiring decision?"

Then four alternative answers were read to the respondent. The responses received were as follows:

It is required	9.5%
It's important but not required	37.9%
Not too important	23.8%
Not important at all	28.8%
	100.0%

Table 1 presents the means for our training investment and productivity growth variables calculated separately by the reported importance of vocational education in selecting new employees for that job.

TABLE 1

THE RELATIONSHIP BETWEEN REQUIRING VOCATIONAL EDUCATION AND THE AMOUNT OF ON-THE-JOB TRAINING

	Importance of School-Provided Vocational Training			
	Required	Important, But Not Required	Not Too Important	Not At All Important
Hours Spent In Specific Training Activities In the First Three Months				
Watching others do the job	57.3	58.0	43.1	33.8
Formal training programs	17.0	12.9	10.7	6.2
Informal training by management	61.0	57.3	48.3	42.2
Informal training by coworkers	23.8	30.5	20.7	19.4
Training time index	187.9	175.8	142.2	113.4
Reported Productivity				
Index value in first 2 weeks	45.3	47.9	48.2	51.4
Index value in next 10 weeks	61.5	63.6	64.6	67.0
Index value at 2 years	82.5	81.4	80.1	82.0
Rise between 2nd and next 10 weeks	16.2	15.6	16.5	15.5
Rise between first 3 months and 2nd year	21.0	17.9	15.4	15.0
Ratio of Training Costs During First 3 Months to Productivity of Worker with 2 Years Tenure				
Trainees lower productivity	.28	.22	.19	.19
Total cost (conservative assumptions)	.55	.46	.39	.38
Total cost (liberal assumptions)	.66	.56	.46	.43

Jobs that require previous school-based vocational education also offer new employees more on-the-job training (see table 1). In the first three months, new employees in jobs that require previous school-based vocational training average 57 hours of watching others do the job, while those with jobs not requiring vocational training spend only 34 hours watching others. For formal training the contrast is 17 versus 6 hours, for informal training by management, the contrast is 61 hours versus 42, and for informal training by coworkers the contrast is 24 versus 19.4. The fifth line of table 1 presents an index of the value of the time invested in on-the-job training during the first three months at a new job. The management staff members who provide formal and informal training are assumed to be paid one and a half times as

as much as the trainee. Not all of this time calls for a complete loss of current output, however, because informal training generally calls for one of the participants to be directly involved in a production activity. The training time index is equal to .8 times hours watching others plus 1.8 times hours in formal training programs plus 1.5 times hours of informal training by management plus hours of informal training provided by coworkers. The index can be viewed as an estimate of the number of hours of staff (weighted) and trainee time that is devoted to training during the first three months (520 hours) of tenure. Jobs that require vocational education have a mean index value of 188, while jobs for which vocational education is not important at all have a mean index value of 113.

The impact of this training can be assessed by examining how the reported productivity of the typical new workers rises with tenure.[1] The questions that asked for a supervisor's report of the productivity of typical new employees were worded as follows:

> Please rate your employee on a productivity scale of zero to 100, where 100 equals the maximum productivity rating any of your employees in (NAME'S) position can attain, and zero is absolutely no productivity by your employees.
>
> 1. What productivity score would you give your typical worker who has been in this job for two years? (PROBE FOR NUMBER)
>
> 2. Now, for each of the following time periods, compare the productivity on this same scale of (NAME 1 and NAME 2 and your tyical worker in this position. What is the productivity of (NAME/your typical worker) during (READ LIST) . . .

	NAME 1	NAME 2	TYPICAL WORKER
A. (His/her) first 2 weeks of employment?	_____	_____	_____
B. From (his/her) 3rd week of the 12 week at work?	_____	_____	_____
C. (DO NOT ASK FOR TYPICAL WORKER) Today? OR, IF NAME NO LONGER WORKS FOR COMPANY READ: The last week NAME worked for your company?	_____	_____	

1. The interview questions about the productivity of recently hired employees were intended to provide ordinal indicators of the relative productivity of one worker at different points in time or two different workers in the identical job. They are not attempting to measure productivity in any absolute sense and therefore are not comparable across firms. Many of the uses made of these data only require that the magnitude of training investments that combine time inputs of other staff with the lower productivity of the trainee require an assumption that the index is cardinal and proportional of true productivity plus a random error.

Table 1 presents data on the productivity of the typical worker according to whether vocational education is required or not. We expect greater amounts of on-the-job training to be associated with larger improvements in the productivity index as the employee's tenure increases. The rise of the productivity index over the course of the first month or so of employment does not seem to vary with the importance the employer places on previous vocational training. The increase between the first three months and the end of the second year, however, is much greater in the jobs that require vocational education--21.0 points or 34 percent--than it is in jobs for which vocational education is not important--where productivity is raised by 15 points or only 22 percent.

An examination of table 2 reveals that there are substantial differences among occupations in the number of hours new hires spend in training. During the first three months, the typical professional, technical, or managerial employee spends 14 hours in formal training, 98 hours in informal training, and 70 hours watching others do the job. Service workers seem to receive only 5.6 hours of formal training and 50 hours of informal training, and they spend only 29 hours learning by watching others do the job. Lower investment in training seems to be associated with smaller rises in the productivity index. The productivity index of service workers rises only 11.6 points between the third and twenty-fifth months of employment. By contrast, the productivity index of professionals, technicians, and managers rises 21.5 points, and that of clerical workers rises 20.4 points.

TABLE 2

OCCUPATION AND THE COST OF TRAINING A WORKER

	Professional Technical Managerial	Clerical	Sales	Blue-Collar Occupations	Service
Hours Spent In Specific Training Activities In the First Three Months					
Watching others do the job	70.2	50.5	51.9	45.2	28.9
Formal training programs	14.2	12.2	15.3	9.3	5.6
Informal training by management	71.4	54.5	54.9	49.1	33.7
Informal training by coworkers	26.4	26.8	25.1	26.2	15.9
Training time index	199.3	168.3	166.5	142.0	99.6
Reported Productivity					
Index value in first 2 weeks	45.3	44.7	46.5	49.9	55.8
Index value in next 10 weeks	60.4	62.8	62.6	64.8	70.8
Index value at 2 years	81.8	83.1	79.8	80.1	82.4
Rise between 2nd and next 10 weeks	15.0	18.1	16.0	14.9	15.0
Rise between first 3 months and 2nd year	21.5	20.3	17.4	15.3	11.6
Ratio of Training Costs During First 3 Months to Productivity of Worker with 2 Years Tenure					
Trainees lower productivity	.24	.25	.24	.20	.15
Total cost (conservative assumptions)	.53	.48	.47	.41	.30
Total cost (liberal assumptions)	.64	.57	.54	.49	.36
Number of Observations	325	600	369	849	491

The association between training time and growth of the productivity index reflects both the payoff of greater inputs of training time and the greater need for early investment in training in occupations where new employees starting out are significantly less productive than employees who have been on the job for a while.

The bottom three rows of tables 1 and 2 present indices of training cost that combine information on the time spent in specific training activities and the lower productivity of new workers. The first of the three rows reports the proportionate amount by which the productivity index of new employees in their first three months of employment is lower than the productivity index of workers with two years of tenure.[2] In jobs that require previous vocational education, new employees in the first three months of employment have a productivity index that is typically 25 percent lower than that of workers with two years of tenure. In jobs for which vocational education is not important at all, new employees typically have productivity indexes that are 19 percent lower than those of workers with two years of tenure. Professional, technical, and managerial employees are reported to start out at an average of 28 percent below workers with two years of tenure (see table 2). New employees in a service occupation seem to start out with a penalty of only 15 percent. These data tend to confirm the proposition that learning curves for highly skilled jobs start lower and rise more slowly than for unskilled jobs.

The other two rows of the bottom panel of tables 1 through 4 are our estimates of the total cost of on-the-job training during the first three months of employment. Costs are calculated relative to the productivity of a worker with two years of tenure. The conservative estimate of OJT costs is obtained by adding the value of the time expended by others--management and coworkers--to the estimate of the new worker's lower productivity.[3] The liberal estimate of OJT costs assumes that the trainee produces no current output when he/she is engaged in formal training or watching others do the work and so adds

---

2. If employer reports of a worker's productivity are equal to an unknown constant times the worker's true marginal product plus a random error, percentage differences in cell means of the productivity index can be interpreted as unbiased estimators of percentage differences in true productivity. If the variations in the productivity scores assigned by supervisors exaggerates the proportionate variations in the true productivity, the estimates of the magnitude of training costs given in the bottom three rows of tables 1 through 4 will be too large. Even though it is possible for a worker's true productivity to be negative, the scale was defined as having a lower limit of zero. Floors and ceilings on a scale typically cause measurement errors to be negatively correlated with the true value. In our case this may result in an understatement of the percentage differences between groups and therefore of the magnitude of training costs.

3. The following assumptions produce this calculation: employer reports are a constant times true productivity plus a random error. The managerial and coworker time reported to be devoted to training is 100 percent devoted to training as reported, the managerial staff members who provide training are paid 1.5 times what workers with two years of tenure earn, and the reported lower productivity of new workers relative to those with two years of tenure captures the loss of trainee productivity because of training activities.

the value of the trainee's time devoted to formal training and watching others to the conservative estimate of OJT costs.[4] The value of trainee time devoted to informal training by management and coworkers is not added because employers report that most informal training activities call for a supervisor or more experienced coworker to supervise, watch and/or advise the trainee while the trainee is engaged in a directly productive activity.

The most remarkable thing about these estimates is their large size. Using liberal assumptions, professionals receive on-the-job training investments during their first three months of employment that cost the firm and the employee 64 percent of the contribution to output of someone with two years of experience in the firm. Under conservative assumptions, the cost is 53 percent of an experienced worker's output. Jobs that require previous school-based vocational training offer a similarly high level of on-the-job training. Even the unskilled service jobs that one would think would not involve much training seem to have OJT costs during the first three months of between 30 and 36 percent of the experienced worker's wage. Overall, the highest level jobs involve the proportionately greatest amount of on-the-job training.

The relationship between on-the-job training and establishment size is explored in table 3. A strong positive relationship was anticipated. Some types of training seem to increase with size (formal on-the-job training and informal training by coworkers), but another type of training (informal training by management), is used most frequently by very small establishments. When these counteracting effects are combined, establishments with over 500 employees have the highest training time index, but establishments with fewer than ten employees have the second highest index. The cost of training also seems to follow a U-shaped pattern--highest in small and large establishments and lowest in establishments with 10-50 employees. The increase in the productivity that results from the training seems to be greater in establishments with more than 100 employees. This might be interpreted as suggestive evidence that the training provided by large establishments is more effective than that provided by small establishments.

The impact of an establishment's rate of employment growth on the cost and effectiveness of training is explored in table 4. Our hypothesis was that the cost of training would be higher and its effectiveness lower in fast growing firms. Establishments growing more than 20 percent do seem to invest more time in training their new employees than firms growing more slowly. The growth of the productivity index does not seem to be correlated with the firm's rate of employment growth. The level of the productivity index at all

---

4. The first three assumptions are the same. The fourth assumption is that the productivity scores that are assigned describe the trainees' contributions to current output when they are not engaged in training activities and when receiving informal training by management or coworkers. During the other two kinds of training activities--formal training and watching others do the job--the trainee is assumed to contribute nothing to current output.

TABLE 3

THE RELATIONSHIP OF COST OF TRAINING A WORKER TO ESTABLISHMENT SIZE

	Employment at Establishment				
	0-9	10-49	50-100	500-499	500+
Hours Spent In Specific Training Activities In the First Three Months					
Watching others do the job	48.9	44.2	53.5	48.7	59.6
Formal training programs	11.0	9.5	11.8	9.3	25.8
Informal training by management	59.4	43.9	51.2	45.9	56.8
Informal training by coworkers	22.1	24.4	25.1	28.1	52.2
Training time index	161.9	135.4	160.3	140.7	228.2
Reported Productivity					
Index value in first 2 weeks	48.7	50.1	49.7	44.5	43.2
Index value in next 10 weeks	63.7	65.4	66.8	63.5	62.7
Index value at 2 years	81.0	80.7	82.5	84.1	84.0
Rise between 2nd week and next 10 weeks	15.0	15.3	17.0	19.0	19.5
Rise between first 3 months and 2nd year	17.3	15.3	15.6	20.6	21.3
Ratio of Training Costs During First 3 Months to Productivity of Worker with 2 Years Tenure					
Trainees lower productivity	.21	.20	.21	.26	.31
Total cost (conservative assumptions)	.46	.39	.41	.45	.59
Total cost (liberal assumptions)	.55	.46	.50	.53	.68
Number of Observations	1043	907	271	262	54

TABLE 4

THE IMPACT OF GROWTH ON THE COST OF TRAINING A WORKER

	Growth Rate of the Establishment Between December 1980 and December 1981				
	Increase Over 20%	Between 5 to 20%	Between +5 to -5%	Between -5 to -20%	Decline of Over 20%
Hours Spent In Specific Training Activities In the First Three Months					
Watching others do the job	55.7	51.0	46.6	47.0	42.3
Formal training programs	15.8	14.9	8.2	8.9	11.5
Informal training by management	65.7	41.2	49.5	48.2	59.6
Informal training by coworkers	26.2	27.3	24.1	26.5	19.2
Training time index	184.7	151.7	137.3	153.0	167.7
Reported Productivity					
Index value in first 2 weeks	46.9	47.7	50.0	47.0	48.9
Index value in next 10 weeks	62.3	64.1	65.5	64.4	64.3
Index value at 2 years	80.3	81.0	82.2	80.5	81.4
Rise between 2nd week and next 10 weeks	15.4	16.4	15.4	17.4	15.4
Rise between first 3 months and 2nd year	18.0	16.9	16.8	16.4	17.1
Ratio of Training Costs During First 3 Months to Productivity of Worker with 2 Years Tenure					
Trainees lower productivity	.22	.23	.20	.21	.22
Total cost (conservative assumptions)	.46	.42	.41	.43	.49
Total cost (liberal assumptions)	.56	.51	.49	.50	.57
Number of Observations	329	397	1167	304	337

stages in the employees' tenure does seem to be somewhat lower in the very fast growing firms. This tends to support the hypothesis that fast growing firms cannot set their hiring standards quite as high as can firms with stable levels of employment. The fact that the output of training--rises in the productivity index--is no greater in the fast growing firms than in the stable firms even though training investments are greater suggests that rapid organizational expansion may reduce the effectiveness of the firm's training. While these results are suggestive, conclusions cannot be drawn until well-specified multivariate models predicting training investments and outcomes have been estimated. This task will be taken up in later work.

3. DOES SCHOOL-PROVIDED VOCATIONAL EDUCATION BENEFIT EMPLOYERS?

The vocational education provided by schools can aid employers in two ways. It can make jobs that require previous school-based vocational education easier to fill and it can lower the wage that must be paid in these jobs. This is a market level phenomenon and will not be addressed in this paper (see Gustman and Steinmeier [1982] for a discussion of the impact this phenomenon has upon benefit cost analysis of vocational education). The second way in which employers may benefit is if the vocationally trained workers they hire typically are more productive and require less on-the-job training than other workers doing the same jobs who have had no such training. This section of the paper is devoted to testing for such an effect.

3.1 Theory

If labor markets were perfectly competitive and information on the quality of potential job applicants were complete and without cost, competition would force firms to pay new employees exactly what they contributed to the firm. Firms would select their employees and set their wage rates in such a way that the output produced by a new employee net of training costs would exactly equal the wage paid the new employee.[5] If a firm pays the same wage to all its new hires, there will be no identifiable class of these new hires that is more productive than any other. This occurs despite the fact that some categories of job applicants (e.g., those with previous vocational training) may have a higher average productivity level than others. Each firm evaluates its job applicant and offers a job only to those whose expected productivity exceeds a cutoff point. Firms will be more likely to make job offers to applicants with characteristics (e.g., vocational training or previous work experience) associated with a high productivity level. Workers whose expected productivity is substantially above firm A's cutoff point, know that other firms offering better jobs will recognize their productive potential and therefore choose not to apply at firm A or choose to turn down firm

---

5. The sentence assumes that training produces general skills. If training produces specific skills "net of training costs" should be replaced by "net of the employee's share of training costs."

A's job offer. Workers with expected productivity that is below firm A's cut-off point either do not apply (because they know they are not qualified for the job) or are not offered a job when they do apply. These workers must settle for jobs at firms that offer somewhat less attractive positions. The assumption of perfect markets, costless information, and no variation in the firm's starting wage necessarily implies that everyone hired by the firm has the same expected productivity.

Labor markets, however, are not perfect, and information about the competence of job applicants is incomplete and costly to obtain and the training received is not all general. Circumstances may therefore arise whereby certain classes of employees (i.e., vocationally trained workers) are on average more productive than other employees who do the same work and are paid the same wage. One circumstance that would produce such an outcome has already been described: a tendency for vocational-technical institutions to focus their training on occupations that are in shortage. Another circumstance that might produce such an effect is a systematic tendency of employers to underestimate the benefits of school-provided vocational training (and possibly overestimate the value of their own on-the-job training).[6]

A third circumstance that can produce such an effect is employer monopsony power in the local labor market for the specific skill a training program produces.[7] Training programs that are responsive to the needs of one large employer in a rural area will typically give that employer the requisite monopsony power. Let us assume, for example, that the only employer of air conditioner assemblers in a labor market needs to hire 100 new employees. Doing the training itself will cost the company $3,000 per trainee, so the company persuades the local community college to set up a program to train air conditioner assemblers that costs the public $2,000 per trainee. It hires all 80 graduates of the program and provides in-house training to another 20 inexperienced new hires. To keep turnover low, the company sets its wage rate at slightly above the going wage for unskilled labor in that labor market. The employees who received training at public expense (and who, as a consequence, require less OJT and are more immediately productive) do not receive higher wages than those trained in-house, because both sets of workers have the same unattractive alternative--leave their current jobs and take unskilled jobs at a lower wage. No other employer in town can use the very specific skills these workers have developed, and employers who do need these skills in other

---

6. Employers may also make systematic errors in evaluating other aspects of a job applicant's credentials. Ivar Berg (1970) claims that employers exaggerate the true value of schooling, and many other studies have claimed that employers underestimate the productivity of women and minorities.

7. An employer has monopsony power in a particular segment of the labor market when the firm is faced with a rising supply curve for workers in that segment. This typically occurs when the firm is the major or one of only a few major employers in a local labor market of people trained in a specific occupation.

labor markets do not offer jobs that are sufficiently more attractive to induce trained employees to move out of town. The result is that the trainees receive only slightly higher wages than they might otherwise have obtained. A standard benefit-cost analysis that looks at the impact of training on the wage rates of trainees would suggest to policymakers that, despite its high placement rate, the training program had failed. In fact, however, the training program was a great success. The employer saved $240,000 in training expense at a cost to the public of only $160,000.[8]

A fourth circumstance that can produce this effect is significant variability--either random or systematic with the season or the business cycle--in the quality of the new hires a firm is able to attract. For example, when the economy is at the bottom of a recession, firms are typically able to hire workers with greater than average amounts of previous training and experience and higher than average levels of expected productivity. At the peak of the cycle when labor markets are tight, the employers are typically forced to hire workers who have less training and experience, and who are less productive. The result is that some of a firm's employees (those hired during a recession) are simultaneously more productive and better credentialed (i.e., have greater training and experience) than other employees. Thus, seasonal and cyclic variations in the tightness of labor markets can produce a positive within-firm correlation between productivity and credentials even if all new hires at any given point in time have identical expected productivity. There is also likely to be significant random variation in the expected productivity of new hires. Most job seekers have much less information about available jobs than is assumed in models of perfect labor markets. When offered a job, they cannot be sure how good it is. Learning about alternatives takes time and money. The costs of a job search--travel costs, lost earnings, and mental anguish--are considerable, so an unemployed job seeker with one offer in hand will not turn it down unless he/she expects future offers will be forthcoming that are considerably more attractive. About three-quarters of all unskilled and semi-skilled job seekers accept the first job offer they receive. As a result, employers find that some of the time they are lucky and are able to recruit and hire a worker with exceptionally strong credentials and higher than average expected productivity. On other occasions, the best qualified job applicants turn the offers down and the firm must settle for someone with average credentials and expected productivity. Thus, random variation in the expected quality of the new hires may produce a positive correlation between productivity and credentials, even among people doing the same job who are paid the same wage.

---

8. Even if the air conditioner manufacturer is the sole beneficiary in the first round, it will not generally be the only beneficiary. If the availability of free training provided by the community college induced the air conditioner manufacturer to open its plant in town, all workers in the town benefit because total demand for labor and, therefore, everyone's wage rates will be somewhat higher as a result. If the free training induced the firm to expand output, consumers will benefit as well. Effects such as the two mentioned in this footnote are pecuniary externalities that influence a benefit-cost analysis only to the extent policymakers care about the distribution of benefits. They leave the total dollar sum of benefits unchanged.

The argument of the previous paragraphs implies that when looking across workers doing the same job, there should be a positive correlation between realized productivity and positively valued credentials such as previous relevant work experience and vocational education, and that this correlation should exist even if everyone is paid the same wage. By a similar argument we would also expect that when looking across a pool of workers doing the same job, there would be a negative correlation between the amount of training a specific new employee receives and the individual's positively valued credentials, such as previous relevant work experience and vocational training. If such correlations appear and the better qualified new hires are not paid higher wages, employers will receive a hidden externality benefit when the number of workers with positively valued credentials is expanded. If such correlations appear and the better qualified workers in the job receive higher wages to exactly the degree that they are more productive and less costly to train, no externalities are created, but employers benefit from increases in the number of such workers because such increases tend to lower the wage that must be paid to obtain a good worker.

3.2 Testing for Employer Benefits

Testing the hypothesis that employers benefit when they hire already trained workers requires that we measure the association between background and job performance in a sample of new hires. There is no need for a structural model of the impact of background on job performance. Structural models of the relation between background and performance in a sample of job applicants cannot be estimated using these data without bias because of the truncated nature of the sample (the job applicants who were believed to have low productivity were not hired, so observations on their job performance are not available) (Brown 1982). The point of the previous section's theoretical discussion is not that certain background characteristics have positive impacts on productivity, but rather that given this positive correlation and the selection mechanisms at work in the labor market, positive associations will continue to exist between these characteristics and job performance even when the job, the employer, and the wage rate are all held constant.

Our method of testing for association between background and job performance is to compare two individuals at the same firm in the same job (an alternate, less preferred approach is described in appendix A). A simple way to implement this comparison is to estimate univariate or multi-variate regressions predicting the difference between the training received by (or reported productivity of) person 1 and person 2 as a function of the differences in their background characteristics. Let us assume that in a sample of people who have been recently hired, job performance (Y_{ij}) depends upon personal characteristics (X_{ij}) and job characteristics (Z_j). Thus we have:

$$Y_{ij} = BX_{ij} + \theta Z_j + u_{ij} + v_j \qquad (1)$$

where

Y_{ij} is a vector of outcomes such as training time, supervisor reports of a worker's productivity, or wage rate of employee "i" in job "j",

X_{ij} is a vector of credentials or background characteristics of employee "i" in job "j",

Z_j is a vector of measurable characteristics of the job (j) including characteristics of the employer,
u_{ij} is a random error that is specific to the individual,
v_j is job specific or respondent specific error.

A problem arises if we estimate equation 1. Because the wage rate and the amount of training received depends upon unmeasured characteristics of the job that are correlated with characteristics of the occupant of that job, the covariance of X_{ij} and v_j is almost certainly nonzero, so biased estimates of coefficient vector B will be produced. This problem can be finessed by differencing equation (1) and estimating a model predicting the differences in the outcomes experienced by two people in the same job at the same firm as a function of differences in their background characteristics, as is shown in equation (2).

$$Y_{1j} - Y_{2j} = B(X_{1j}-X_{2j}) + u_{1j} - u_{2j} \qquad (2)$$

where person 1 and 2 both work in the same job "j"

Estimating this model produces unbiased estimates of B if the X_{ij}'s are not correlated with the u_{ij}'s.

The sample of jobs for which paired data are available was generated in the following manner. A stratified random sample of 3,712 employers was interviewed. Three hundred of these did not have the time for a long interview, so shortened questionnaires were administered. Employers who received the full questionnaire were asked to select "the last new employee your company hired prior to August 1981 regardless of whether that person is still employed by your company." A total of 818 employers could not provide information for a recent new hire. Most of these firms were small organizations that had not hired anyone in recent memory. The employers that provided information on one new hire were asked to provide data on a second new hire in the same job but with contrasting amounts of vocational education. Of the 2,594 employers that provided data on one new hire, 1,511 had not hired anyone else in that job in the last two years, and 424 hired anyone with a different amount of vocational training for that position in the last two years. As a result, data are available on 659 pairs of individuals who have the same job at the same establishment. Missing data on specific questions used in the model further reduced the sample used for estimation to about 590.[9] Most of the establishments from which paired data are available are small. Seventy percent have fewer than 50 employees and only 12 percent have more than 200.

The hypothesis being tested relates to the zero order relationship between background characteristic and various indicators of job performance (controlling only characteristics of the job that may vary within the pair), not to partial relationships controlling for other background characteristics.

---

9. A number of respondents seem to have misunderstood our question and reported that management and coworkers spent more than 520 hours training the new employee. These observations have been dropped from the analysis until there is time to call up the respondents and check the answers. Models that include these observations but change the response to 520 hours, have lower R squares and lower t statistics but coefficients remain roughly the same.

TABLE 5

IMPACT OF VOCATIONAL EDUCATION ON TRAINING COSTS,
REPORTED PRODUCTIVITY AND WAGE RATES

	Model 1	Model 2			Percent Impact of Recent Relevant Voc Ed
	New Hire Received Voc Ed	New Hire Received Voc Ed	New Hire Has Recent Relevant Voc Ed[1]	New Hire Is Voc Ed Student	
Hours Spent In Specific Training Activities In the First 3 Months					
Formal training programs (mean = 12.8 hrs)	-1.21 (1.21)	1.17 (2.26)	-3.85 (3.07)	-1.05 (3.96)	-21%
Informal training by management (mean = 74.6 hrs)	-3.00 (1.98)	3.40 (3.57)	-10.36* (5.05)	1.53 (6.50)	- 9.3%
Informal training by coworkers (mean = 46.3 hrs)	- .63 (1.29)	4.26* (2.32)	-5.89* (3.28)	-2.76 (4.24)	- 3.5%
Training time index (mean = 225.5 hrs)	-6.17 (5.39)	14.26 (12.31)	-30.70* (16.67)	-1.12 (17.65)	- 8.3%
Reported Productivity					
Index value in first 2 weeks (mean = 48.8)	2.06* (.88)	-1.48 (1.58)	5.68* (2.21)	2.51 (2.83)	9%
Index value in next 10 weeks (mean = 64.5)	2.31* (.86)	- .30 (1.61)	4.24* (2.20)	.86 (2.78)	6.4%
Current or most recent index value (mean = 81.5)	3.67** (1.16)	1.16 (2.03)	4.18 (2.78)	2.80* (3.44)	6.6%
Logarithm of Wage Rate					
Starting Wage	.013* (.006)	.002 (.012)	.023 (.017)	.001 (.020)	2.5%
Current Wage	.036** (.007)	.038* (.014)	- .003 (.019)	.025 (.029)	3.5%

All models include control variables for whether the worker is currently a voc ed student, hired in a temporary job, was known to be eligible for a subsidy when hired and current average hours per week. Models for the current or most recent wage and productivity index have additional controls for tenure and tenure squared. Model 1 has a single dummy for new hire received vocational education. Model 2 has that dummy and another dummy for new hire has relevant vocational education. In all other aspects the two models are the same. The standard error of the estimate is in parentheses below the coefficient.

[1]The "new hire has relevant vocational education" variable is defined as follows: it is zero if no vocational education was received or the vocational education is reported by the employer to be not at all related to the job. If the training is reported to be "very" related the dummy is one and if it is reported to be somewhat related the dummy is .5.

**Significant at the .01 level on a one-tail test

*Significant at the .05 level on a one-tail test

Therefore, each of the available background characteristics--vocational education, previous relevant work experience, age, education, sex, and referral source--was entered separately into the model. The only characteristics that had statistically significant associations with most or all indicators of the training required and productivity of the new hire were relevant vocational education and years of relevant previous work experience.[10] Characteristics of the job worker/match that might influence time devoted to training, reported productivity, or wage rate were controlled. In all models, controls were entered for: hours worked per week, a dummy equal to one when the job was supposed to be temporary, a dummy equal to one when the employee was eligible for subsidy and the employer knew this when the hire decision was made and a dummy equal to one when the employee was going to school part-time while working. In models of current or most recent reported productivity and wage rates, tenure and tenure squared (differenced) were both included as controls. The number of months since the hiring and its square are differenced and entered in the models of starting wage rates.

New hires who have received vocational education seem to require smaller amounts of on-the-job training. The negative association is not statistically significant, however, unless we focus specifically on vocational training that is relevant to the job. New hires who have recently received relevant vocational training require 2.6 fewer hours of formal training (a 21 percent reduction), 7.0 fewer hours of informal training by management (a 9.3 percent reduction), and 1.6 fewer hours of informal training by coworkers (an 3.5 percent reduction) than people who have not had such training. Employees who have had vocational training that was not relevant to the job seem to have a nonstatistically significant tendency to require more training than people who have had none. The hypothesis that relevant vocational education as opposed to irrelevant vocational education lowers OJT costs can be accepted at standard significance levels for both forms of informal training and for the training time index that combines all three types of training. If the comparison is specified as being between those with relevant vocational education and those with none, similar statistically significant results are obtained (see table 7). The impact of the number of years of vocational education on the required amount of on-the-job training was tested in models not reported in table 5, and no relationship was found.

New hires with vocational training have a statistically significant tendency to have higher reported productivity than those with no such training. The point estimates imply that training that is irrelevant to the job is associated with slightly lower reported productivity in the first two weeks, but not to a statistically significant extent. In later months, irrelevant vocational education has essentially no association with the productivity index.

---

10. A model which simultaneously enters all background characteristics produces moderate increases in significance and small increases in the absolute size of the coefficients on relevant vocational education. The size and significance of relevant job experience rises in models of training time and productivity which contain age and age squared. In the wage rate models, coefficients on relevant job experience decline when age is added to the model.

Relevant vocational education is associated with considerably (and statistically significantly) higher reported productivity than irrelevant vocational education. Compared to someone without vocational training, a new hire with recent relevant vocational education has productivity indexes that are 9 percent higher on average in the first two weeks, 6.4 percent higher in the next ten weeks, and 6.6 percent higher at the time of the interview six to thirty-six months after being hired. Models not reported in table 5 tested for an impact of years of vocational education on reported productivity. Those with greater amounts of vocational training were not, however, reported to be more productive than those with lesser amounts.

Those with vocational education had slightly higher wage rates than others in the same job who had no school-provided vocational training. The differentials are statistically significant: starting wages are 1.2 percent higher, and current wage rates are 3.6 percent higher. If we make assumptions about the scaling of the productivity index and the valuation of the time devoted to training by management and coworkers, a comparison can be made between proportionate differences in wage rates and proportionate differences in productivity net of training costs. The comparisons that follow assume that the reported productivity index is a proportionate transformation of true productivity plus a random error and that the cost of the time devoted to informal training by coworkers is equal to the wage of a worker with two years of tenure and that the time devoted by management is worth 1.5 times that wage. At the time of the interview (or when the individual leaves the firm if he/she has left), the wage advantage of workers with relevant vocational training is roughly equivalent to their 4.5 percent productivity advantage. The hypothesis that relevant vocational training has equal proportional impacts on the current wage and on current productivity would not be rejected by the data. During the first three months, however, vocationally trained workers are extremely good buys for the firm. New hires with relevant vocational education are 18 percent less costly to train and 6 to 9 percent more productive in their work than workers with no vocational training. When these two effects are combined, we estimate that the firm reduces its training costs during that three-month period by an amount equal to 7.5 percent of three months output by a worker with two years of experience.[11] Since the new hire with relevant vocational training is paid only 2.5 percent more on average than the new hire without such training, the employer of these workers receives an externality equal to 5 percent of the output of workers with two years tenure for three months. This evidence seems to imply that training and placing workers in relevant jobs produces a hidden externality equal to about 5 percent of the first three months wages.

---

11. In the second section of this paper, we calculated that the time spent by other staff training the new employee had a value equivalent to 33 percent of three months output from a worker with two years of tenure. An 7.3 percent reduction means that training costs have been reduced by 2.4 percent of a tenured worker's output. The higher productivity of the vocationally trained worker has a value equal to 5.1 percent of a tenured worker's productivity. Thus, the reduction in total training costs during the first three months is 7.5 percent of a tenured worker's output.

Eighty-seven of the approximately 600 vocationally trained workers in the matched sample were receiving school-provided vocational training while they were employed at the firm. Thirty of these were sixteen to seventeen when hired and thus were likely to have started at the firm while still high school students. Many of their jobs were probably first arranged through cooperative education programs. Another thirty-three were hired when they were between eighteen and twenty-one and were probably either working their way through college or attending school part-time in the evening. Column 4 of table 5 presents coefficients on a dummy that captures the effect of being a vocational student while one is an employee. We anticipated that being a student might conflict with work obligations and that employers would report part-time students to be less productive than other vocationally trained workers. Instead, they do not seem to be less productive or to require greater amounts of OJT than workers who have completed their programs.

The effect of differences in relevant job experience on differences in the training costs, productivity, and the wage rates of two people holding the same job is examined in table 6. Job experience has a major impact on all of these variables. Both experience and its square are significant predictors of all the outcomes studied. The sign and significance of the coefficient on experience squared imply that there are diminishing returns to additional years of experience. For example, the first year of experience is associated with a 1.1 point higher current productivity index, the ninth year of experience raises this productivity index by .9 points, and the twentieth year raises the index by .6 points. In column 3 of table 6 we present the calculated effect of five years of previous relevant job experience on training time, reported productivity, and wage rate. Column 4 presents the calculated effects of ten years experience. Five years of previous relevant job experience lowers required formal training by 39 percent, required informal training by management by 19 percent, and required informal training by coworkers by 19 percent. Five years of experience, in comparison to no previous experience, is associated with a reported productivity index that is 16 percent higher in the first two weeks, 11 percent higher in the next ten weeks, and 6 percent higher six to twenty-four months after being hired. Wage rates are higher as well. Compared to those with no previous experience, those with five years experience typically receive 9.3 percent higher starting wage rates and 8.3 percent higher wage rates after one or two years on their new job. The proportionate response of the current productivity index and current wage rate to experience is very similar. The data would not reject the hypothesis that proportionate responses are equal. During the first three months, however, the training costs savings from hiring an experienced worker are approximately 16.1 percent of the productivity of a worker with two years of tenure.[12]

Five rather than zero years of previous experience seems to raise wage rates, however, by only 9.3 percent so firms that hire workers with five years

---

12. Inputs of training time by others (under conservative assumptions, the value of training time by others is 33 percent of the output of a worker with two years tenure) declined by 22 percent. This reduces training costs by 7.3 percent of the three month output of a worker with two years of tenure. Productivity rises by an amount equal to 8.8 percent of the output of a worker with two years tenure.

TABLE 6

EFFECT OF YEARS OF PREVIOUS RELEVANT JOB EXPERIENCE
ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES

	Relevant Experience	Relevant Experience Squared	Effect of First 5 Years Experience	Effect of 10 Years Experience
Hours Spent In Specific Training Activities In the First 3 Months				
Formal training programs (mean = 12.3 hrs)	- 1.15** (.42)	.029** (.011)	-39%	-66%
Informal training by management (mean = 74.6 hrs)	- 3.19** (.70)	.070** (.018)	-19%	-34%
Informal training by coworkers (mean = 46.3 hrs)	- 2.02** (.46)	.049** (.012)	-19%	-33%
Training time index (mean = 225.5 hrs)	-11.27** (1.85)	.269** (.050)	-22%	-38%
Reported Productivity				
Index value in first 2 weeks (mean = 48.8)	1.78** (.30)	-.041** (.008)	16%	28%
Index value in next 10 weeks (mean = 64.5)	1.58** (.30)	-.035** (.008)	11%	19%
Current or most recent index value (mean = 81.5)	1.14** (.37)	-.025** (.010)	6%	11%
Logarithm of Wage Rate				
Starting Wage	.018** (.0020)	-.00046** (.000057)	9.3%	16.6%
Current or Most Recent Rate	.016** (.0025)	-.00037** (.000067)	8.3%	14.8%

All models include control variables for whether the worker is currently a voc ed student, hired in a temporary job, was known to be eligible for a subsidy when hired and current average hours per week. Models for the current or most recent wage and productivity index have additional controls for tenure and tenure squared. The standard error of the estimate is in parentheses below the coefficient.

**Significant at the .01 level on a one-tail test

of previous relevant experience rather than no experience seem to receive externalities equal to about 10 percent of three months output by a worker with two years tenure. Ten years of experience seems to produce externalities equal to about 15 percent of three months output of a tenured worker.

3.3 The Effects of Establishment Size on the Payoff to Previous Training or Experience

Bureaucratic companies are less able to tailor training, job assignments and wage rates to the background of a new employee (Foulkes 1980). Small firms are less bureaucratic so consequently one would expect them to be more likely to adjust their training to the amount of occupationally specific training the new employee brings to the firm. A job in a small establishment is likely to have a broader more loosely defined set of duties. Such jobs are likely to give greater scope to the individual worker's ability and previous training so one would expect that the impact of previous training on the productivity of the new worker would be greatest in small firms. Small firms can also be hypothesized to be more able to adjust the wage they pay for a particular job to the background and experience of the individual that fills the job.

TABLE 7

EFFECT OF RELEVANT VOCATIONAL EDUCATION ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES BY ESTABLISHMENT SIZE

	Establishment's Employment Level			Probability that large establishments are not less sensitive to credentials	Probability that relevant voc ed has no effect in establishments with 16 emp.
	2 Employees	16 Employees	200 Employees		
Hours Spent in Training Activities in the First 3 Months					
Formal training	- 2.8	- 1.5	0.2	.037	.012
Informal OJT by management	-12.1	- 7.6	- 0.8	.043	.003
Informal OJT by coworkers	- 3.5	- 1.6	1.1	.145	.185
Training time index	-34.3	-19.9	1.0	.033	.005
Reported Productivity					
Index value in first 2 weeks	5.9	4.3	2.1	.108	.0002
Index value in next 10 weeks	7.8	4.6	0.2	.005	.0001
Current or most recent index value	9.1	4.7	- 1.4	.002	.001
Logarithm of Hourly Wage					
Starting wage	.046	.027	0.0	.018	.001
Current or most recent wage	.040	.030	.017	.174	.001

These three hypotheses were tested by interacting establishment size with the dummy variable for the receipt of relevant vocational education and with the amount of previous relevant work experience. The calculated effect of

relevant vocational education on required training, reported productivity, and wage rates for establishments of two employees, sixteen employees, and 200 employees are presented in table 7. The fourth column of the table reports the statistical significance of the interaction term--the probability of incorrectly rejecting the hypothesis that relevant vocational training has no greater impact in small establishments than in large establishments. The interaction is statistically significant at the .05 level for all but two outcomes--informal training by coworkers and current wage rates. The fifth column reports the statistical significance of the main effect of a relevant vocational education on training, productivity, and wage rates for an establishment with sixteen employees. Eight of the main effects are statistically significant at the .02 level. An examination of the third column of the table reveals that a large establishment's vocational education has essentially no impact on any of the outcomes (except possibly on reported productivity in the first two weeks).[13] The impacts reported for establishments with only two employees are quite large: a 34 hour reduction in the training time index, an increase in reported productivity of six points in the first two weeks, eight points during the next ten weeks and nine points six to twenty-four months after being hired. For the very small firm, the benefits of hiring a new employee with relevant vocational education seem to be considerably greater than the additional costs. In the first three months wage rates are 4.6 percent higher but training costs have been reduced by an amount equivalent to 14 percent of the output of a worker with two years of tenure.[14] Six to twenty-four months after being hired vocationally trained workers are 11 percent more productive but are paid only four percent extra.

---

13. Sensitivity tests were conducted to see if this effct was really a consequence of who the respondent was rather than the size of the establishment. The interviewer was instructed to change respondents to the employee's immediate supervisor if the primary respondent said he did not know how much time was spent training the particular employee we were discussing or how productive that employee had turned out to be. Some of our primary respondents in large establishments may have tried to answer the questions even though their role--accountant, personnel officer or treasurer--may not have given them an opportunity to observe how well individual new hires were doing. To test for this, a dummy was created for primary respondent works in the personnel, accounting or treasurer's department of an establishment with at least 50 employees and there was no change in respondent when these questions were reached. When this dummy was interacted with the vocational education variables and entered into the models it was statistically insignificant and the pattern of coefficients on the size vocational education interaction fell only slightly.

14. Productivity during the first three months rises by an amount equal to 9 percent of a tenured worker's output. The time devoted to training the new employee declines by 15.2 percent (34.3/225.5). Under conservative assumptions these training time costs are 33 percent of a worker's productivity with two years of tenure, so the cost savings from hiring a worker with relevant vocational education is 14 percent ($9 + .33 \cdot 15.2$).

Table 8 presents separate estimates of the effect of five years of work experience on training requirements, reported productivity, and wage rates for establishments with 16 and with 200 employees. The impact of previous relevant experience on informal training and the training time index seems to be smaller in large firms, but the effect is not as dramatic as it was for vocational education and in most cases is not statistically significant. Establishment size seems to have no effect on the influence of previous experience on starting wage rates and reported productivity in the first two weeks. There does seem to be a moderate impact of establishment size on the influence of previous experience on current or most recent wage rates and reported productivity in the third through twelfth weeks of employment at the firm.

TABLE 8

EFFECT OF FIVE YEARS OF PREVIOUS RELEVANT WORK EXPERIENCE ON TRAINING COST, REPORTED PRODUCTIVITY, BY ESTABLISHMENT SIZE AND WAGE RATES

	Establishment's Employment Level		F Test for Inclusion of size experience interactions
	16 Employees	200 Employees	
Hours Spent in Training Activities In the First 3 Months			
Formal training	- 4.9	- 4.3	1.2
Informal OJT by management	-15.5	- 5.5	4.0
Informal OJT by coworkers	- 9.5	- 4.5	0.9
Training time index	-53.1	-20.9	.9
Reported Productivity			
Index value in first 2 weeks	7.7	7.9	.3
Index value in next 10 weeks	7.4	4.3	1.69
Current or most recent index value	5.7	4.7	.06
Logarithm of Hourly Wage			
Starting wage	.078	.084	.11
Current or most recent wage	.080	.055	2.2

3.4 The Payoff to Previous Training or Experience by Occupation

The effects of occupationally specific training were examined separately for five different occupational categories--service workers, blue-collar factory workers, sales workers, clerical workers, and professional, technical and managerial workers. Table 9 presents estimates of the impact of relevant vocational education on training time, reported productivity and wage rates. While some of the individual interactions were statistically significant, the data does not reject the hypothesis of no interactions between occupation and vocational education. The point estimates, however suggest that relevant vocational education has very different effects in different occupations. Reduction in training time was greatest in the sales and service occupations and essentially zero in clerical occupations. Impacts on reported productivity are greatest in blue-collar, sales and clerical occupations and smallest in professional, technical, and managerial occupations. The impacts of relevant vocational training on wage rates is greatest in blue-collar jobs, second

largest in service jobs and essentially zero or negative in professional, technical and managerial jobs. During the first three months of employment the estimated externality generated by vocational education of sales workers is 14 percent of the productivity of a worker with two years tenure. It is 10 percent for service workers, 7 percent for blue-collar workers, 4 percent for professional, technical, and managerial workers, and zero for clerical workers. There is an interesting pattern to these results. Studies of the effect of occupationally specific training on the wages of trainees find that clerical training of women seems to have very positive effects but that most training programs for men have negligible or negative effects (Campbell et al. 1981, Daymont and Rumberger 1982, and Meyer 1982). If we take our point estimates at face value, the measures of employer benefits of training developed above have the opposite pattern. Employers seem to receive no spillover benefits from hiring trained clerical employees but seem to receive significant spillover benefits from hiring trained sales, service, and blue collar workers. Since the social benefit of training is the sum of the trainee and employer benefits, it may be that these employer benefits justify types of vocational training that studies of trainee benefits have generally found to have no economic payoff.

TABLE 9

THE EFFECT OF RELEVANT VOCATIONAL EDUCATION
ON TRAINING COSTS, REPORTED PRODUCTIVITY AND WAGE RATES
FOR DIFFERENT OCCUPATIONS

	Professional Technical Managerial	Clerical	Sales	Blue Collar	Service
Hours Spent in Training Activities In the First 3 Months					
Formal training (mean = 9.5 hrs)	- 1.2	2.4	- 2.1	- 2.1	- 5.4
Informal OJT by management (mean = 48.2 hrs)	- 3.1	-2.8	-10.3	- 5.7	-11.3
Informal OJT by coworkers (mean = 23.1 hrs)	- 5.2	-0.2	- 0.5	- 1.1	1.1
Training time index (mean = 138.5 hrs)	-22.1	9.2	-30.3	-19.0	-30.5
Reported Productivity					
First 2 weeks (mean = 48.8)	2.3	3.7	4.1	5.5	0.9
Next 10 weeks (mean = 64.5)	- 1.6	2.9	7.8	4.8	3.6
Current or most recent (mean = 81.5)	1.4	1.4	5.4	4.8	3.2
Logarithm of Hourly Wage (in Percent)					
Starting wage	- 0.5	1.5	1.3	3.0	3.4
Current or most recent wage	- 1.3	1.5	0.7	5.3	3.0

Occupational variation in the impact of relevant work experience on training time, reported productivity, and wage rates is examined in table 10. The estimates of the impact of experience reported in this table were obtained by entering interactions between four occupation dummies and experience and experience squared into the models. While some of these interactions were statistically significant, tests on the addition of the group of eight variables typically did not yield statistically significant improvements in

explanatory power of the models. Our point estimates, however, suggest experience has very different effects in different occupations. The previous experience of new employees in professional, technical, managerial, and sales seems to lead to very large reductions in training time and the big improvements in reported productivity and wage rates. For blue-collar workers the impact of experience is somewhat smaller but still quite substantial. While previous work experience does not seem to produce important reductions in the time required to train service workers, it does seem to be related to service workers being more productive and receiving higher wage rates. Clerical workers with greater amounts of previous experience do not require less training and are somewhat more productive in the first three months but not more productive at the time of the interview.

TABLE 10

THE EFFECT OF FIVE YEARS OF PREVIOUS RELEVANT WORK EXPERIENCE ON TRAINING COST, REPORTED PRODUCTIVITY AND WAGE RATES FOR DIFFERENT OCCUPATIONS

	Professional Technical Managerial	Clerical	Sales	Blue Collar	Service
Hours Spent in Training Activities In the First 3 Months					
Formal training	- 7.0	-3.9	- 14.7	- 5.3	3.8
Informal OJT by management	-28.1	4.5	- 36.7	-14.0	-10.2
Informal OJT by coworkers	-23.7	1.7	- 11.3	-11.5	- 0.8
Training time index	-93.2	-4.3	-113.8	-51.2	-13.0
Reported Productivity					
Index value in first 2 weeks	19.4	4.5	- 0.9	8.8	7.1
Index value in next 10 weeks	12.7	4.8	8.1	7.3	3.2
Current or most recent index value	10.8	0.1	7.8	6.8	5.1
Logarithm of Hourly Wage					
Starting wage	.139	.086	.027	.084	.039
Current or most recent wage	.092	.066	.135	.079	.036

One way of summarizing these results is that on-the-job training of clerical workers seems to produce specific skills that do not transfer well to other employers while on-the-job training of professional, technical, managerial, sales, and blue-collar workers seems to produce many general skills that do transfer to other employers. These results imply that future employers receive large spillover benefits when they have professional, technical, managerial and sales personnel with significant amounts of OJT. Moderate-sized spillover benefits occur in the blue-collar occupations. There are essentially no spillover benefits in clerical and service occupations.

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

The preliminary analysis of data from the NIE-funded Employer Survey has yielded some important insights into employer-provided skill training and

school-provided vocational education. Employers reported that school-provided vocational training was required for 9.5 percent of the jobs studied and "important but not required" for another 37.9 percent of jobs.[15] School-provided vocational training seems to be complementary with employer-provided on-the-job training. Jobs that have school-provided vocational training as a prerequisite for hiring offer newly hired workers greater amounts of on-the-job training.

Once the job and employer are specified, there is a limited amount of substitutability between the two types of training. The analysis of paired comparison is the best way to measure the association between a background characteristic and reported productivity, and between required training time and offered wage rate for different occupants of the same job. When comparing occupants of the same job at the same firm, we found that new hires with relevant school-provided vocational training required about 7 percent less on-the-job training than new hires with no training. While this reduction was statistically and substantively significant, there was no evidence that additional years of vocational training could further reduce the employer's training costs.

Employers reported that job occupants with relevant school-provided vocational training were significantly more productive than the job occupants who lacked such training. The productivity index was 9 percent higher in the first two weeks and 6 to 7 percent higher thereafter. Wage rates were higher as well. During the first three months, training cost reductions of 7.5 percent of the output of a worker with two years of tenure seem to be achieved. The training cost reduction is significantly greater than the increment in starting wage rates that a person with relevant vocational background is able to obtain.

The finding that new employees who have relevant school-provided vocational training are less costly to train (but not much more costly to employ) than the other employees without such training hired for the same job implies that there are hidden benefits of vocational education that are not being measured by traditional studies of the returns to vocational education (if corrected for self-selection bias). Vocational training benefits society in three ways: by raising the wage rates and earnings of the people who receive school-provided vocational education, by lowering the wage rates of certain types of skilled and semiskilled jobs (therefore lowering the prices of the products produced by firms that employ these workers), and by providing hidden externality benefits to firms that hire trained workers. The present study is the first to provide evidence of this third effect.

Other important policy implications of the data analysis are derived from the finding that a vocationally trained worker's reported productivity is

---

15. The sample of jobs studied was not a random sample of all jobs in the economy. The selection mechanism oversampled high turnover jobs and the jobs offered by small companies.

higher and training costs lower only when the job makes use of the training received. Daymont and Rumberger (1982) and Campbell et al. (1981) have obtained similar results in analyzing the New Youth Cohort of the National Longitudinal Survey (NLS). Compared to those with a general education, those who took high school vocational education courses earned more when their jobs were related to their training and earned less when their jobs were not related to their training. Fredland and Little (1980) obtained similar results for the mature men's sample of the NLS.

The following policy implications would seem to be logical in light of the finding that students and their employers benefit from vocational training only when the job they obtain is related to their training:

- Vocational education/training by schools and other public agencies should focus on generic occupational skills that are useful in a great variety of jobs (e.g., typing, filing, computer programming, etc.) or on more specific skills that are and will remain in shortage (e.g., nursing).

- A high rate of training-related placement is a valid immediate goal for a vocational program.

- To ensure the best possible match between the student's personality and abilities and the occupation selected and therefore to ensure a high persistence in that occupation, students should have tried the job out and received counseling before committing themselves to a lengthy and very specific training.

- Training in skills that are specific to one firm or a small industry should be undertaken by public institutions only when jobs are guaranteed by potential employers and many years of tenure can be expected.

Another major finding of the study is that new hires with a good deal of relevant job experience prior to being hired take less time to train and have higher productivity indexes than new hires for the same job who have no such job experience. These differences are both statistically and substantively significant. Compared to those with no experience, new hires with five years of relevant job experience tend to have productivity indexes that are 16 percent higher in the first two weeks, 11 percent higher in the next ten weeks, and 6 percent higher after six to twenty-four months. Those with more than ten years of relevant job experience have productivity indexes that are 28, 19, and 11 percent higher, respectively. Required training time is reduced as well. In this sample the new employee with five years of experience received about five fewer hours of formal OJT and about twenty-three fewer hours of informal OJT than a new hire with no previous experience. Five years of experience reduces the training time index by about 22 percent. When the effects on productivity and training time are combined, the data imply that hiring a worker with at least five years of relevant job experience rather than one with no experience saves the firm during the first three months resources

equivalent to 16 percent of the output of a worker with two years tenure. Starting wage rates are only 8 percent higher for workers with five years of experience, so the firm benefits (receives a spillover) when it hires an experienced employee. The productivity advantage of those with previous relevant experience continues into the second and third years at the firm, but it diminishes enough so that productivity effects and wage effects become roughly equal.

The findings about productivity, training time, and wage rates imply that on-the-job training by employer A not only benefits the employee and employer A (as implied by Becker's theory of on-the-job training), but also benefits other employers in the industry who hire workers who quit or are laid off by employer A. In other words, OJT creates externalities--social benefits that are not captured by either the trainer or the trainee. As in the case of vocational training, a market failure exists and the case for government subsidy of the externality-creating activity is strengthened.

When calculating the social benefits of vocational training or of on-the-job training/work experience, these externalities should be added to conventionally measured benefits derived by comparing the earnings of workers who have received the training to the earnings of comparable individuals who have not received it.[16] While the externalities we have identified are substantively important, they are not likely to be large enough by themselves to cause benefit-cost ratios to be greater than one unless the incremental cost of vocational as opposed to academic education is very small. A rough estimate of the size of the externality is 5 percent of three months' wages for relevant vocational training and 8 percent of three months' wages for five years of relevant job experience. The evidence for the existence of an externality relates only to the first three months. We have no measures of time inputs into training beyond the first three months, and our data on differentials in reported productivity and wage rates six to twenty-four months after being hired are consistent with a hypothesis of no continuing externalities. Five percent of three months' wages is 1.25 percent of a year's wage. The externality arises only when individuals find job that are relevant to their training at firms that also hire those without vocational training for the same job. Only one-half to two-thirds of vocational program graduates do find such jobs, further diminishing the effect. On the other hand, the data suggest that many of the benefits of vocational education remain even when a job change occurs many years after the training. An upper bound estimate on the

---

16. These estimates of the size of externalities produced by vocational training and on-the-job training are determined by subtracting estimates of impacts of each type of training on wage rates from estimates of impacts on training cost reductions. These calculations have a critical dependence on a number of assumptions about the valuation of staff training time and the relationship between our productivity index and true productivity. Consequently, the confidence intervals around our point estimates of the size of these externalities are quite wide, and more confirmatory research is required.

possible size of the externality is obtained by assuming that 60 percent of the individuals' jobs are relevant to training and are at firms that also hire those without vocational training, that the beneficial impact of training does not diminish, and that job changes occur regularly every two years. With a real discount rate of 10 percent, the present value of the externality benefit is 3.8 percent of a year's wages. If half of all jobs are relevant to the training and the effects of training have a half life of ten years, the present value of the externality benefit is 1.9 percent of a year's wages. Assuming that job changes occur every four years, the present value would be reduced further to about 1.1 percent of a year's wages. CETA-sponsored classroom or OJT training, in contrast, seldom costs less than 20 percent of a year's wages. Studies of the instructional costs of school-based vocational training programs have found that they are typically more expensive than academic programs (Cohn and Hu 1973). If the typical two-year program had incremental costs of $2,000.00, the figure to which the present discounted value of the externality would need to be compared would be about 7 or 8 percent of a year's wages.

Regardless of the size of such a hidden externality, the socially optimal amount of OJT will (for reasons already described in the introduction) not be provided unless the employer, the employee, and the public all share in its costs. For a number of reasons (e.g., minimum wage, immediate needs for income, lack of foresight, discrimination), employees are often unable or unwilling to pay a large enough share of the costs of training (by accepting low wage rates early in their job tenure) to make it profitable for the employer to provide it. Hashimoto (1981) offers evidence that young and disadvantaged workers are particularly likely to find the minimum wage a barrier to obtaining jobs with significant learning opportunities.

Currently, school-based occupational training receives public subsidy, while employer-provided training does not. The differential availability of subsidies may have resulted in schools' offering types of occupational training that might better be obtained as part of a job. It may be that expansion of employer training would yield an exceptionally large social payoff (Bishop 1982, chapter 8). Methods of promoting and/or subsidizing employer-provided training are not easy to devise, however.

One approach is to offer subsidies to employers that offer training that is integrated with a school or college's curriculum (the Targeted Jobs Tax Credit offers such a tax credit for hiring disadvantaged high school cooperative education students). Another approach might be to offer young people leaving high school a voucher/scholarship that can be used to buy training from an employer as well as to pay college tuition. Still a third approach would be to offer a tax credit to employers that provide certain approved kinds of training. The major difficulty with the latter two approaches is that one cannot subsidize something one cannot measure, and measuring OJT is notoriously difficult. Before policies to subsidize OJT can be contemplated, we must know much more about employer-provided OJT.

Still another way society can promote on-the-job skill training is for community colleges (or some other public agency) to establish cooperative

training ventures with specific local employers in which teachers on the college's payroll provide training that meets that employer's specifications. Many states and localities now offer this kind of aid to companies that open or expand plants in the community. Publicly subsidized institutions seem to be becoming increasingly important providers of skill training that is customized to a particular employer's needs. It is not clear, however, that publicly controlled institutions have a comparative advantage in this type of activity and that lacking the public subsidy they would be effective competitors in this market. If not, efforts to promote on-the-job skill training might better be focused on offering the subsidy to the worker or firm and letting them choose who shall provide the training.

The policy implications discussed above rest upon an assumption that OJT and school-based training cause productivity to go up and required training time to go down. An association, however, does not prove causation. This study is no less subject to selection bias problems than any other study of vocational education. An alternative interpretation of the association that has just been demonstrated is that the students who chose to take vocational education (or who obtain five years of relevant work experience) are faster learners and more productive workers before they enter the program (or get their previous job). The fact that occupationally specific training is associated with positive outcomes only when it is relevant to the job is evidence for the assumed causal explanation of the association. Nevertheless, we feel that for this and other reasons policymakers should be cautious in drawing policy inferences from these data.

The findings described above must be viewed as preliminary. Data problems necessitated dropping about 100 firms from the sample that we hope to include in later analyses. Some of the reported training time differences between paired employees were very large. Some of these observations were not deleted from the analysis sample. Future plans include contacting the firms that seem to be outliers to confirm the correctness of their answers and to obtain verbal explanations of the reasons for large differences in training time or productivity. This process may result in a revision of some of our data and/or a reinterpretation of some of our findings. The data revisions that are planned are not likely to change the basic findings that both school- and employer-provided training raise reported productivity and wage rates and lower the training required by new employees. The relative size of wage, reported productivity, and training cost differentials might change, however, and this in turn might produce major changes in estimates of the size of the hidden externality (which depends upon the relative size of these differentials). While much of the policy discussion does not depend on finding a hidden externality, the strength of the argument for subsidizing school-provided vocational education and employer-provided on-the-job training is influenced by the size of such externalities.

The reader is also reminded that the questions used to measure training time and productivity are new and that, therefore, their reliability and validity have not been established. In most cases the respondent was the boss

or general manager of a small establishment--someone who would be familiar both with the productivity and the training received by particular new employees. The author's major concern about the dependent variables is the possibility that different respondents used different referents in comparing the productivity of their employees and that some respondents may have reported as training time days when they were actually attending to their new employee only a small part of the time. No serious problem is created if inevitable errors in measurement are random. To ferret out systematic biases, if any, we are planning an examination of the validity of supervisor reports of time spent in informal training and the productivity of specific employees by stationing observers in the work place and obtaining concrete measures of output from company records. This kind of research is expensive, however, and will take time to complete.

APPENDIX A

ALTERNATIVE MEASURES OF THE IMPACT OF OCCUPATIONAL SPECIFIC TRAINING

APPENDIX A

In this appendix we present a different way of testing for associations between the background--previous vocational training and relevant job experience--that a new employee brings to the firm and that person's productivity, training costs and wage rate. This method involves asking the employer how much more or less productive (costly to train) a specific employee is than a typical employee. The specific versus typical differentials that result are then tabulated by the type and amount of vocational training and the previous relevant job experience of the specific new hire. Compari- sons are than made between the mean differential for those with and without each specific characteristic. The specific-typical comparison can be made every time the employer has provided data on one or more specific employees, so sample sizes of nearly 3,000 result. The disadvantage of this approach is that the qualities and credentials of the "typical" new hire are not measured. In many cases the specific-typical comparison would be between two people with identical amounts and kinds of vocational training and job experience. All firms were asked to provide data on one new hire with vocational education and one new hire without vocational education. Of the 2,594 firms that provided us data on one new hire, 1,511 had not hired anyone else in that job in the last two years, 424 had not in the last two years hired anyone for that job with a different amount of vocational training. Only 659 firms gave us data on a matched pair of new hires, one with and one without vocational education. It would seem that for many jobs aggregate turnover is so small, that the firm has to seek out a new employee only once every few years. In other cases, none of (or all of) the firms hires for a particular position had vocational education. When, for the reasons cited above, data can be obtained on only one worker, comparisions between specific new hires and typical new hires would seem to be very imperfect measures of the effect of vocational education on training costs or productivity. These problems will cause this method to give downward biased estimates of the effect of vocational education.

Tabulations of Comparisons Between Specific and Typical Workers

In this appendix we present tabulations of the amount by which a specific new hire receives more or less training than is typical for that job. The variable has been tabulated by whether the particular new hire received school based vocational training and by the amount of relevant work experience. In table A-1 we examine whether, holding the job constant, the amount of on-the-job training a new hire receives is influenced by the amount and type of school based vocational education. When all types of vocational training are pooled, vocational training has no effect on informal OJT by management and coworkers and lowers formal training by 1.7 hours. If we limit our focus to new hires who have received vocational training that their employer reports is "very relevant" to their job, the reduction in the required training is greater: formal training is 2.3 hours lower, informal training by management is 0.9 hours lower and informal training by coworkers is 1.0 hour lower. None of these differences is statistically significant. The reduction

in the training time index is only about 5 percent (11.6 hours), and total costs of training fall by only about 3 percent. Employers do not seem to achieve big savings in training costs when they hire vocationally trained workers.

Employers do, however, achieve considerable savings in OJT when they hire workers with considerable amounts of relevant work experience. The effect of work experience on the training required by a new hire is presented in table A-2. New hires with four to seven years (37-95 months) of work experience seem to receive an average of five fewer hours of informal training by management, an average of three fewer hours of informal training by coworkers and 4.5 fewer hours of formal training. The training time index falls by about 15 percent (34.5 hours) and total training costs are reduced by about 10 percent.

The vocational training and work experience of the specific new hire seems to have a large proportionate impact on the number of hours of formal training that an individual receives. The background of the new hire has a much smaller proportionate impact on informal training. This finding suggests that formal OJT is a closer substitute for previous work experience and for previous vocational training than informal OJT. Table A-3 presents the adjustments of formal training time that are associated with various amounts of vocational education and previous work experience.

The hypothesis that new employees who have received school provided vocational training or have great amounts of relevant job experience are more productive than other employees in the same job can be tested by measuring whether specific new hires with these characteristics are reported to be more productive than the typical new employee in the same job. Supervisor reports of a new employee's productivity were obtained for three separate points in that employee's career: the first two weeks, the next ten weeks and currently.

In tables A-4 through A-7 we present data on the productivity index differential--the difference between the reported productivity of a new worker of specified job experience and vocational training and a typical new worker. Table A-4 organizes the data by the type of vocational education and the amount of relevant work experience. The top element in each cell is the productivity index differential for the first two weeks. The second element in each cell is the productivity index differential for the thrd through thirteenth weeks of employment. The third element is the differential at the time of the interview generally six months to two years after being hired.

Our hypothesis that new workers with previous school provided training index were more productive than those without is not supported by these data. Productivity differentials between specific and typical workers were almost identical for those with and without vocational training in both the first two weeks and the third through thirteenth week. Vocationally trained employees were reported to be a statistically significant two points less productive than those without such training. There is a slight suggestion in the data that in the first three months new hires who received vocational education at

a high school or junior college have slightly lower productivity indexes than untrained workers and those who received it at a four year school have a slightly higher index. After a year or so the pattern of productivity index differentials is reversed with the graduates of high school vocational programs doing slightly better than the products of voc-tech institutions and four year colleges. None of the differences for specific types of vocational training are statistically significant, however.

Tables were constructed examining how the productivity differential varies with the relatedness of vocational training to the job (table A-5) and with the number of years of vocational training (tables A-6 and A-7). These features of the vocational training did not seem to have any consistent effects on the reported productivity differential.

The tabulations reveal that previous relevant work experience is strongly associated with reported productivity. Compared to new hires with two years of previous relevant job experience, those with no experience have productivity indexes that are three points lower in the first two weeks, two points lower in the next ten weeks and 2.7 points lower a year or so after being hired. Compared to those with two years of experience, those with more than eight years of previous relevant experience have productivity indexes that are seven points higher in the first two weeks, 4.7 points higher in the next ten weeks and 4.2 points higher a year or so after being hired. For employees with about one year's tenure the effect of a year of work experience on productivity is about 1.6 percent per year for the first two years, about 0.8 percent per year for the next three years and about 0.4-0.5 percent per year thereafter.

TABLE A-1

EXTRA ON-THE-JOB TRAINING BY VOCATIONAL EDUCATION BACKGROUND OF NEW HIRE

	Hours of Formal OJT (mean = 10)	Hours of Informal OJT by Management (mean = 48)	Hours of Informal OJT by Coworkers (mean = 23)	Number of Cases
No Vocational Education	0.3	-5.3	0.0	1842
Voc Ed at High School	0.5	-8.0	1.4	171
Voc Ed at Junior College	-0.8	-7.3	4.2	85
Voc Ed at Voc Tech School	-2.5	-5.8	-2.2	389
Voc Ed at Four Year College	-4.0	-2.6	3.9	122
Less than One Year of Voc Ed	-3.8	-4.7	-1.8	210
One Year of Voc Ed	-0.7	-5.5	-0.2	186
Two Years of Voc Ed	-2.3	-3.5	1.0	248
More than Two Years of Voc Ed	-1.9	-7.7	1.8	142
Very Relevant Voc Ed	-2.6	-6.2	-1.0	427
Somewhat Relevant Voc Ed	-1.3	-4.9	1.3	306
Not at all Related Voc Ed	-0.6	-3.6	0.5	109
All Vocational Education	-2.0	-5.5	0.0	850

The entries in the table are the difference between the hours of on-the-job training received in the first three months by a new worker with the specified type and amount of vocational training and the OJT received by a typical new employee.

TABLE A-2

EXTRA ON-THE-JOB TRAINING BY VOCATIONAL EDUCATION AND PREVIOUS JOB EXPERIENCE OF NEW HIRE

Type of Vocational Education	Months of Relevant Work Experience					
	Total	Zero	1-12	13-36	37-95	96+
Hours of Formal OJT (mean = 10)						
Previous Voc Ed	-2.0	1.7	-1.7	3.3	-8.3	- 9.0
No Voc Ed	.3	.2	.7	- .8	-1.6	- 1.4
Hours of Informal OJT by Management (mean = 48)						
Previous Voc Ed	-5.5	-3.2	-2.9	-1.8	-8.2	- 4.5
No Voc Ed	-5.3	-2.7	-2.7	-5.0	-7.7	-19.8
Hours of Informal OJT by Coworkers (mean = 23)						
Previous Voc Ed	0.0	.7	1.1	1.3	-7.1	.5
No Voc Ed	0.0	1.7	-2.6	.9	- .5	- 2.2

The entries in the table are the difference between the hours of on-the-job training received in the first three months by a new worker with specified experience and vocational training and the OJT received by a typical new employee.

TABLE A-3

EXTRA FORMAL ON-THE-JOB TRAINING BY AMOUNT AND
RELEVANCE OF VOCATIONAL EDUCATION OF THE NEW HIRE

Type of Vocational Education	Months of Relevant Work Experience					
	Total	Zero	1-12	13-36	37-95	96+
No Vocational Education	- .3	.2	.7	- .8	- 1.6	-1.4
Very Relevant Voc Ed	-2.4	1.3	-3.1	-3.4	- 7.1	1.9
Somewhat Relevant Voc Ed.	- .9	2.1	- .2	-2.2	-20.0	-1.6
Not at All Relevant Voc Ed	- .5	.9	0.0	-2.7	0.0	0.0
Less than One Year	-3.3	- .4	-2.3	-2.3	-10.0	3.9
One Year	- .7	3.7	-1.2	0.0	36.7	0.0
Two Years	-2.1	- .4	-2.7	-3.0	- 7.0	0.0
More than Two Years	-1.5	1.5	0.0	-8.9	0.0	- .6

The entries in the table are the difference between the hours of formal on-the-job training received in the first three months by a new worker with specified experience and vocational training and the formal on-the-job training received by a typical new employee.

TABLE A-4

PRODUCTIVITY INDEX DIFFERENTIAL BY
INSTITUTION PROVIDING THE VOCATIONAL EDUCATION

Type of Vocational Education	Months of Relevant Work Experience					
	Zero	1-12	13-36	37-95	96+	Total
Voc Ed at a High School	1.2	4.4	- .6	8.3	4.0	1.7
	.2	2.8	2.3	1.4	.6	.7
	-1.1	-5.6	-8.3	4.1	4.2	-2.3
Voc Ed at a Junior College	4.0	-4.1	.6	10.0	3.8	1.7
	4.8	-1.5	-1.9	6.3	-5.0	1.1
	-2.2	-5.0	-8.3	4.1	4.2	-3.2
Voc Ed at a Voc-Tech School	-1.3	-1.7	7.6	8.2	10.2	2.5
	-1.4	-1.3	-4.2	6.7	7.9	1.7
	-7.6	-6.6	-1.3	1.5	3.4	-3.8
Voc Ed at a 4-Year College	2.6	2.8	.3	1.5	9.3	3.1
	2.5	1.1	-1.3	3.8	10.3	2.4
	-3.3	-9.1	-5.7	-2.7	6.9	-4.2
No Vocational Education	.1	1.3	2.9	5.5	10.5	2.3
	.2	.5	2.6	3.2	7.5	1.6
	-3.5	-3.9	- .8	1.2	2.3	-2.0
Total	.4	1.0	3.3	5.7	10.4	2.3
	.3	.3	2.5	3.6	7.2	1.5
	-4.1	-5.1	-1.4	.6	2.8	-2.6

The entries in the table are the difference between the reported productivity index of a new worker with specified experience and vocational training and the reported productivity index of a typical new hire in that same job. The top entry in each cell gives the difference for the first two weeks. The second entry in the cell reports the difference for the next ten weeks of employment. The bottom entry is the difference between current productivity index of the specific worker and the productivity index of the typical worker after two years.

TABLE A-5

PRODUCTIVITY INDEX DIFFERENTIAL BY RELATEDNESS OF VOCATIONAL EDUCATION TO THE JOB

Type of Vocational Education	Months of Relevant Work Experience					
	Zero	1-12	13-36	37-95	96+	Total
Voc Ed Very Related	.5	3.9	5.3	2.2	11.0	2.8
	.3	3.4	4.0	3.1	6.9	2.0
Voc Ed Somewhat Related	.3	-.6	2.0	7.0	3.6	1.4
	.3	-.8	.6	8.1	3.2	.7
Voc Ed Not at All Related	1.7	2.5	.9	8.2	9.0	2.3
	1.3	1.2	1.7	4.5	10.0	1.7
No Vocational Education	.1	1.3	2.9	5.5	10.5	2.3
	.2	.5	2.6	3.2	7.5	1.6
Total	.4	1.0	3.2	5.7	10.4	2.3
	.3	.3	2.5	3.6	7.2	1.5

The entries in the table are the difference between the reported productivity index of a new worker with specified experience and vocational training and the reported productivity index of a typical new hire in that same job. The top entry in each cell gives the difference for the first two weeks. The second entry in the cell reports the difference for the next ten weeks of employment.

TABLE A-6

PRODUCTIVITY INDEX DIFFERENTIAL IN THE FIRST TWO WEEKS BY AMOUNT OF VOCATIONAL EDUCATION

Years of Vocational Education	Months of Relevant Work Experience					
	Zero	1-12	13-36	37-95	96+	Total
Less Than One Year	-0.9 (71)	-0.2 (61)	3.1 (42)	8.3 (25)	5.8 (19)	1.9 (224)
One Year	2.5 (95)	-1.2 (50)	3.7 (40)	10.4 (11)	22.7 (11)	3.2 (213)
Two Years	-1.0 (118)	0.2 (62)	3.4 (51)	5.5 (25)	7.5 (23)	1.3 (295)
More Than Two Years	2.7 (67)	0.4 (36)	2.3 (29)	2.0 (15)	7.2 (18)	2.9 (183)
No Vocational Education	0.1 (661)	1.3 (348)	2.9 (342)	5.5 (209)	10.5 (186)	2.3 (1985)
Total	0.4 (1177)	1.0 (586)	3.2 (545)	5.7 (304)	10.4 (288)	2.3 (2985)

TABLE A-7

PRODUCTIVITY INDEX DIFFERENTIAL IN THE SECOND TEN WEEKS BY AMOUNT OF VOCATIONAL EDUCATION

Years of Vocational Education	Months of Relevant Work Experience					
	Zero	1-12	13-36	37-95	96+	Total
Less Than One Year	0.5 (68)	0.5 (60)	0.8 (40)	7.8 (24)	7.1 (19)	2.1 (216)
One Year	0.5 (92)	-3.2 (50)	4.8 (38)	7.9 (11)	13.5 (10)	1.4 (207)
Two Years	-0.4 (121)	-0.1 (61)	1.9 (49)	2.6 (24)	3.2 (22)	.7 (293)
More Than Two Years	1.4 (65)	0.7 (36)	0.4 (29)	1.1 (15)	5.5 (18)	1.8 (180)
No Vocational Education	0.2 (748)	0.5 (338)	2.6 (336)	3.2 (206)	7.5 (180)	1.6 (1945)
Total	0.3 (1158)	0.3 (573)	2.5 (426)	3.6 (302)	7.2 (278)	1.5 (2920)

APPENDIX B

THE GALLUP ORGANIZATION'S REPORT ON SURVEY PROCEDURES

INTRODUCTION

This is the second wave of a survey of employers designed to measure knowledge, utilization and job retention by employees hired under the tax incentive and employment training programs. For this study, efforts were made to contact a total of 5,421 employers who had been interviewed in 1980 for wave one of the survey. Potential respondents were first contacted by letter, were then called and asked to make an appointment for an interview, and were then interviewed at the scheduled time. An unlimited number of calls were made to each potential respondent in an effort to complete an interview. An effort was made to conduct a very short form of the questionnaire with respondents who refused to participate.

Part way through the interviewing, Gallup believed that sufficient money was available in the budget to conduct supplementary interviews with a new sample. A total of approximately 1,000 supplementary names were given to Gallup. However, due to the inability to confirm full addresses and telephone numbers for a substantial number of these interviews and due to the fact that a large percentage were duplicates of the original sample, the supplementary sample resulted in only 400 useable names. All names sent letters were contacted by Gallup. However, because the interviewing budget was exceeded, interviewing on the supplementary sample was stopped before the effort was exhausted.

PART II

SURVEY PROCEDURES

OHIO STATE SURVEY OF EMPLOYERS - 1982

Summary of Procedures

I. Initial Contacting of Respondents

A. Letter, Worksheet and endorsement by NFIB sent to each. Mailed in waves of about 800.

B. Successive mailings repeated at about three week intervals.

II. Interviewing

A. Executive interviewers trained for 3 days by Nancy Nygreen.

1. Pre-test- The same procedures were used for the pretest interviews as required for the survey, including advance letters, tracking (when necessary), calling to confirm receipt of the letter and to set an appointment for an interview, scheduling call-backs (when necessary), and conducting the interview. Four telephone interviewers completed three or four interviews each. At the completion of these interviews, the Gallup Project Director met with the pretest interviewers and the Director of telephone interviewing for a debriefing.

2. Read Q.drafts for correcting.

3. Practiced interview with one another to become familiar with instrument.

4. Prepared materials in notebook.

a. Contact sheet prepared for every letter sent.

b. Disposition code sheet.

c. Card A - Target site listing.

B. Two weeks following initial mailing contacting and interviewing began.

1. Each interviewer responsible for own assignments (Supervisor coordinated call-backs and appointments in event of illness or absence.)

2. Final dispositions other than completed interview remained in notebook until determination could be made.

3. Decision was made not to stop at 4 or 8 calls if interviewer felt progress still could be made by continuing. (Increase costs incurred by this decision.)

Continued . . .

4. Any respondent not receiving letter (or not recalling same) was sent another mailing and a follow-up call made about 10 days later. (In some instances of repeated failure to have letter delivered properly, a "Return receipt requested" certified mailing was used with considerable success (and cost)). It is estimated that almost 2,000 additional mailings were required.

5. Several weeks following a refusal response, nearly all respondents were recalled by another interviewer to:

   1. attempt an interview or
   2. complete a short form questionnaire. This proved successful in about one-third of the attempts but was stopped by budget constraints.

   Interviewing resulted in: 3,842

3,411	original interviews
300	short form conversions
131	supplemental interviews

6. Total interviewing = 13,800 hours for a net production rate of 1 interview per 3.6 hours of interviewing time. (Supervision, monitor and edit time included in production rate calculations).

C. Monitoring - Quality Control -

1. By silent monitor, every interviewer was monitored during the first three days of their interviewing on this thereafter assignment, and regularly at random. Total monitored equaled 10% of all completed interviews. For 5% of monitored interviews a written comparison questionnaire was filed and reviewed for accuracy and quality. For all monitored interviews a graded evaluation sheet is completed and a complete file of each interviwer's monitor report is kept.

D. Editing

1. First done by interviewer
2. Follow up editing was responsibility of supervisor. Any missing information was obtained by a recontact with respondent. (This was rarely necessary, however).

E. Summary Information

1. Contact sheet of every completed interview - xeroxed for inclusion in consecutive number notebook.
2. All contact sheets placed in order and key punched as to final disposition.

F. Tracking Procedures Follow...

The Gallup Organization, Inc.

MEMORANDUM

TO: Nancy Nygreen

DATE: 6/16/82

FROM: Ann Osborne

JOB NO.: G08213

SUBJECT: Tracking Procedures for Ohio State Survey

COPIES:

Following are the tracking procedures used to determine the status of those companies interviewers were unable to contact using the telephone numbers from the 1980 survey:

1. The telephone number on the contact sheet was dialed to confirm disposition.

2. In all instances the status of incorporated companies was provided by the Secretary of State, Corporations Division. If the company was listed in good standing, the name and address of its agent was obtained who was inturn able to provide the company's correct address and telephone number.

3. An attempt to determine the status of non-incorporated companies was first made through director/ assistance.

4. If directory assistance had no listing for the company, the local Chamber of Commerce was contacted. In most instances, the Chamber of Commerce could provide the company's correct address and phone number; however, occasionally the Chamber of Commerce only had a record of those companies registered with them and could provide no definite information as to the company's status.

5. When the needed information could not be obtained from the Chamber of Commerce, the local municipal office was contacted to check whether the company had renewed its business license.

6. If the municipal office could not provide company status, the local library was called and asked to check their library directory of local companies.

7. As a last resort, the Better Business Bureau was contacted to check whether they had received any complaints about the company as a result of their closing or moving.

All new telephone numbers of companies still in operation were dialed and verified as correct before being sent to the Interviewing Department.

Some of the following are the contacts most productive in tracking:

Florida , Pensacola - Chamber of Commerce (904)353-0300
Better Business Bureau (904)438-4087

IA - Secretary of State - Corporate Division (515)281-5864

Ohio,Toledo- Chamber of Commerce (419)243-8191

Alabama, Birmingham - Secretary of State (205)832-6855

MO, Higginsville - Chamber of Commerce (816)584-3030
Carrolton - Chamber of Commerce (816)542-3400

Colorado, Greeley- Chamber of Commerce (303)352-3566

Texas, San Antonio - Chamber of Commerce (512)229-2100
Corpus Christi - Chamber of Commerce (512)882-6161
Better Business Bureau (512)225-5833

WA,Aberdeen - Chamber of Commerce (206)532-1924
Centralia - Chamber of Commerce (206)736-3161

VA- Chamber of Commerce (703)679-0961
(703)889-1798

OHIO STATE - TRACKING

LA - Chamber of Commerce - Baton Rouge (504)387-1400
Chamber of Commerce - New Orleans (504)527-6900
Better Business Bureau (504)926-3010

Kentucky - Pikeville - Chamber of Commerce (606)432-5504

MONITOR'S INTERVIEWER EVALUATION SHEET

Interviewer's Name: _____ Booth # _____

(or: Home Ext. #___)

Date: _____ Shift: _____ Job # _____

(Circle appropriate rating: 1 = Superior 2 = Good 3 = Adequate 4 = Poor
5 = Completely unsatisfactory)

1. INTRODUCTION overall rating: 1 2 3 4 5

Identification given: full name ___ 1st only ___ None ___

Said "Gallup Organization": yes ___ no ___ said "Poll" ___

Read introduction correctly 1 2 3 4 5
(Comments _____
_____)

2. BALLOT overall rating: 1 2 3 4 5

reads questions correctly 1 2 3 4 5
skips correctly 1 2 3 4 5
probes degrees (i.e., "a great deal", "somewhat") 1 2 3 4 5
open-end probes 1 2 3 4 5
demographics 1 2 3 4 5

Verifies Phone Number: yes ___ no ___

3. LEADING RESPONDENT (does not lead) overall rating: 1 2 3 4 5

leads by rephrasing question 1 2 3 4 5
leads on open-ends 1 2 3 4 5
leads on degree probes 1 2 3 4 5
leads by assuming information (e.g., race, income level) 1 2 3 4 5

4. COURTEOUS TO RESPONDENT 1 2 3 4 5

5. VOICE overall rating: 1 2 3 4 5

diction 1 2 3 4 5
excessive use of "o.k.", "uh-huh", etc. 1 2 3 4 5

6. WAS A CALL NEEDED TO "206" ON THIS INTERVIEWER? Yes ___ No ___
(if "yes", record time _____ and supervisor spoken to _____)

7. ADDITIONAL COMMENTS: No ___ Yes ___ (see other side)

8. FOR ALL NEW INTERVIEWERS: Do you feel this person is ___ can be ___ cannot be ___
a good interviewer? (Comments: _____
_____
_____)

Monitor: _____

III Coding

A. Interviews checked in in batches of 5 by consecutive interview number.

B. Coding required about 25 minutes per interview with 10 minutes additional for occupational coding. (Even after interviewers added questions for description of company).

C. Military code also posed a problem for the coding department (difficult to get exact information from respondent).

D. Open-end questions - Most were pre-coded on the questionnaire so that interviewers' verbatim was merely coded by coders. All digit responses were checked for accuracy and lead 0's recorded if omitted.

E. Errors in editing were sent back to interviewers to recontact respondent. (This occured in very few instances, however).

F. A codebook was developed to specify card and column location of each variable. This was done for each of the three forms of the questionnaire.

G. Look-ups - Any inconsistencies in final data were looked up in original documents as these were put in numerical order at completion of key-punching.

DATA PROCESSING

1. Codebook by Cohen/Oberheim
2. Only to tape
3. Clean data
4. Analysis of response rates
5. All callback information keypunched
6. Interview precoded and precolumned
7. Editing
   - Interviewer
   - Telephone supervisor
   - Coding staff

CODING

- Assume 25 minutes per interview for coding

1. 10% checked by 2nd coder
2. Detailed occupation code
3. Open ends - Coding with Cohen/Nygreen
4. Lists kept of verbatim, misc., 2% of sample gives same response results in new code with recoded prior interviews
5. Open ends based on minimum of 200 responses
6. Coding by teams, questions assigned to groups of coders

KEYENTRY

(a) 10% verification of demo's

(b) 10% of rest of interview

CLEANING

(a) Out-of-range

(b) Internal consistencies

APPENDIX C

THE GALLUP ORGANIZATION'S SURVEY INSTRUMENT

The Gallup Organization, Inc.

GALLUP SOCIAL SCIENCE RESEARCH GROUP

53 Bank Street
P.O. Box 310
Princeton, N.J. 08540
(609) 924-9600

March 22, 1982

The National Center for Research in Vocational Education at Ohio State University and The Gallup Organization, Inc. are conducting the 1982 phase of a national survey of employers. The study measures the impact of various government programs on the quality of the work force and the business environment in your community. This study has received the endorsement of the National Federation of Independent Business and is being funded by the National Institute of Education.

Your company participated in this study in 1980, and you should have received a report on the preliminary study findings. Your participation in this current study is essential if the results are to accurately reflect the impact of government programs on companies like yours. In appreciation of your participation you will receive a summary of the study by next year.

An executive interviewer from The Gallup Organization, Inc. will contact you within two weeks to conduct an interview. The enclosed worksheet will help you prepare for the interview.

All information you provide will be kept strictly confidential; neither you nor your company will be identified by name in the study findings. Your responses will be combined with those of many other organizations from across the country and used for statistical purposes only.

If you have any questions regarding this study, or if you would like to call The Gallup Organization, Inc. to request an interview, please feel free to call (collect) one of the Gallup project directors for this study:

Dr. Mitchell Cohen 609-924-9600 Ext. 226
Dr. Nancy Nygreen 609-924-9600 Ext. 265

I would like to thank you in advance for your participation in this study.

Sincerely,

Mitchell E. Cohen, Ph.D.

MEC/da
Enc.

NATIONAL INTERVIEW OF EMPLOYERS - 1982

WORKSHEET

Below is an outline of the topics we will ask about in the interview. Some of the questions may require that you look up information in your files. Where appropriate, please note this information in the spaces provided on the worksheet.

1. We will inquire about: The number of employees you have or had:

   - currently
   - December 12, 1981
   - July 1, 1981
   - December 12, 1980
   - July 1, 1980

2. Change in unit sales over past two years.

3. The number of employment inquiries and your employment practices during the 10 working days before the interview. We will ask how many persons inquired about jobs were interviewed, and were offered jobs.

4. During all of 1981, how many employees were hired _____, fired _____, quit _____.

5. The next set of questions compares two employees in the same job — one with vocational training in a school setting prior to working for your company and one without vocational training in a school setting.

   The first employee is the last new employee your company hired prior to August 1981.

   The second employee is a worker in the same position as the first employee but with the opposite vocational training background.

   For all these questions it does not matter whether Person 1 or Person 2 is still employed by your company. However, it is essential that Person 1 be the last new employee hired prior to August 1981 to insure that every company uses the same process to select Person 1.

6. For Person 1 and Person 2 we will ask:

   A. First name (This is asked only to make it easier to refer to that person during the interview.)

   B. Job title and duties

   C. Amount of training necessary

   D. Previous military and school-provided training

7. For the position that Person 1 was hired to fill, we will ask:

   A. The number of openings for position at the time of hiring

   B. The number of applications made for this position

   C. The number of job offers made

   D. Average salary in this position

OVER PLEASE

8. Next we will ask about your experience with employee tax credit programs for two periods -- between January 1980 and September 1981 and between October 1981 and today. These tax credit programs are the Target Job Tax Credit (TJTC), Work Incentive Tax Credit (WIN) and On the Job Training Programs (OJT).

For these programs we will ask the number of applicants who were eligible, the number of hires, and the number of certifications.

	TJR/WIN	OJT
Number applicants eligible	_____	_____
Number of new hires eligible	_____	_____
Number of certifications	_____	_____

Thank you for your time. We will be calling in the next 2 weeks.

CONTACT SHEET

OHIO STATE EMPLOYER SURVEY - CO 8213

C.01
1-81
New ID: 2-6
Old ID: 9-13
IF CORRECTED BELOW
NAME: 14-33
TITLE: 40-59
AREA CODE: 60-62
63-81
PHONE: 64-70
STATE 71-72
ZIP: 73-77
78-81
79-80=01
C.02
1=81
NEW ID: 2-6
NAME OF ESTABLISHMENT: 8-34
ADDRESS: 35-59
CITY: 60-76

PLACE
LABELS
HERE

Number of calls (circle one)

4 calls..... 1
8 calls..... 2

Corrected Name/Address (If different from label)

NAME: _____ TITLE: _____

COMPANY NAME: _____

COMPANY ADDRESS: _____

PHONE: _____

C.3 1-81 NEW ID: 2-6
NAME 1: 7-41 TITLE 42-61
62-78-81 79-80=03

2nd NAME: _____ TITLE _____

LENGTH IN MINUTES: ___ ___

77-78
79-80=02

CALL	DATE MO/DAY	TIME	DISPOSITION	COMMENT C.18 151 NEW ID: 2-6	
		a			8-9
1		p			9-10 11-12
		a			13-14
2		p			16-17 18-19
		a			20-22
3		p			23-24 25-26
		a			27-29
4		p			30-31 32-33
		a			34-36
5		p			37-38 39-40
		a			41-43
6		p			44-45 46-47
		a			48-50
7		p			51-52 53-54
		a			55-57
8		p			58-59 60-61

INTERVIEWER'S NAME _____ DATE COMPLETED _____

INTERVIEWER'S I.D. # ___ ___ ___ 64 65-78-81 79-80=16

NFIB National Federation of Independent Business

OFFICE OF THE PRESIDENT

Dear Businessman/Businesswoman:

As you know, the federal government runs many programs that have an impact on our labor markets. We need to have good information about the impact of such programs so that existing and proposed programs can be more sensibly designed. In the near future you will have the opportunity to participate in the evaluation of some of these programs.

In a few days an employee from The Gallup Organization, Inc., a national survey organization, will contact your firm and ask you to provide some information about your labor force and your experience in trying to hire qualified employees. The results of the study will be analyzed by a staff of researchers from the National Center for Vocational Education at Ohio State University. Your participation will be completely anonymous, although the results of the overall survey will be made public.

Your firm has been selected at random from a list of businesses in your area, thus your responses scientifically represent the experiences of these firms. I am writing this letter to ask you to take the time to help provide the necessary data for this important evaluation study. Your participation is crucial if the experiences of companies like yours are to have an impact on government policy.

Sincerely,

Wilson S. Johnson
NFIB President

WSJ:lf

Home Office: 150 West 20th Avenue, San Mateo, California 94403; Telephone (415) 341-7441 / Legislative Office: Washington, D.C.

C.4
1-6l

SCREENER NEW ID: 2-6

** 1982 National Survey of Employers - GO 8213

TIME SCREENER STARTED ____ ____

TIME SCREENER ENDED (S12) ____ ____

LENGTH OF SCREENER ____ ____ MINUTES 6-7

Attach label here
when screener is completed

Respondent Name: _____ 8-13-81

Company Name: _____

S1. CONFIRM COMPANY NAME AND COMPANY ADDRESS

Is this (NAME OF COMPANY)?

Yes -CONFIRM COMPANY ADDRESS. THEN GO TO S4

No -CONFIRM COMPANY BUSINESS. THEN ASK Q.S2

Is your address still (READ FROM LABEL) IF NEW ADDRESS,
RECORD: _____

_____

S2. Did this company ever operate under the name of (NAME OF COMPANY)?

Yes - GO TO S4

No - ASK S3

S3. VERIFY PHONE NUMBER AND LENGTH AT THAT NUMBER.

Is this (READ PHONE NUMBER)?

Yes

No

How long has that been your telephone number?

_____

THANK RESPONDENT AND TERMINATE. RECORD "12" ON CONTACT SHEET.

S4. May I please speak with (NAME FROM CONTACT SHEET)?

(IF (NAME) NO LONGER WITH COMPANY OR CHANGED POSITION ASK:

May I speak with the person who is in the position (NAME) was in 1980/the person who handles the hiring for your company)?

IF (NAME) OUT OF OFFICE FOR A FEW MINUTES OR ON PHONE ASK TO HOLD.

Yes - ASK S5

No (RECORD REASON. TRY TO DETERMINE IF INTERVIEW CAN BE CONDUCTED). _____

_____

_____

_____

TERMINATE. RECORD ON CONTACT SHEET.

C1

S5. WHEN RESPONDENT OR SECRETARY IS ON PHONE:

Hello, my name is _____, and I am calling from The Gallup Organization in Princeton, New Jersey. Gallup and the National Center for Research in Vocational Education (located at Ohio State University*) are conducting the 1982 national survey of employers. You should have received a letter describing the study. Did you receive the letter? (CIRCLE RESPONSE)

Yes (GO TO S7)..... 1

No (READ S6)..... 2

S6. The primary objective of the study is to measure the impact of various government programs on the quality of the work force and the business environment in your community.

Your company participated in this study in 1980, and your participation this year will assure the results of this study will accurately reflect the impact of government programs on the work force. All information you provide will be kept strictly confidential; neither you nor your company will be identified by name in the study findings. Within a year you will be sent a summary report of the findings of the study.

S7. Was (NAME OF COMPANY) in business in (TARGET AREA) with at least one paid employee at any time since January, 1980?

Yes.....ASK S8..... 1 *(14)*

No.....TERMINATE..... 2

DK.....ASK S8..... 8

NA.....ASK S8..... 9

S8. Since October, 1979 has (NAME OF COMPANY) added or closed any new establishments, divisions, or facilities in (TARGET AREA)? (PROBE FOR ADDED OR CLOSED.)

Yes, added.....ASK S9..... 1 *(15)*

Yes, closed....ASK S9..... 2

Both added and closed
ASK S9..... 3

No.....GO TO S10..... 4

DK.....GO TO S10..... 8

NA.....GO TO S10..... 9

* Read only for sites 1, 11, 12, 31

S9. How many have been (added/closed)?

16-17
18-19

NUMBER ADDED: ____ ____

DK..... 98

NA..... 99

NUMBER CLOSED: ____ ____

DK..... 98

NA..... 99

S10. Can I obtain information about hiring procedures for all of your company's establishments in (TARGET AREA) from you?

20

Yes.....GO TO S13..... 1

No.....ASK S11..... 2

DK..... 8

NA..... 9

S11. Please give me the name and address of each of your company's establishments in (TARGET AREA) and the name and phone number of the person most familiar with hiring practices information in each.

	NAME AND ADDRESS OF ESTABLISHMENTS	NAME AND PHONE NUMBER OF CONTACT PERSON
		NONP
1.	_____	_____
2.	_____	_____
3.	_____	_____

IF NO IN S10 AND NAMES GIVEN IN S11, GIVE INTERVIEW TO SUPERVISOR AFTER CONDUCTING INTERVIEW.

(GO TO S13 UNLESS R VOLUNTEERS NOW IS NOT A GOOD TIME READ:)

S12. I'd like to make an appointment to conduct the interview. What would be a convenient time? (RECORD TIME ON CONTACT SHEET).

START OF INTERVIEW

S13. Does your company have any divisions or subsidiaries located other than in (TARGET AREA)?

Yes.....ASK S14..... 1 21
No.....GO TO S15..... 2
DK.....ASK S14..... 8
NA.....ASK S14..... 9

S14. What would you estimate the total number of full-time and part-time employees is in all the divisions and subsidiaries of your company? Is it roughly: READ LIST: (IF DK, PROBE: Just your best guess.)

1 to 49..... 1 22
50 to 99..... 2
100 to 499..... 3
500 to 2000..... 4
More than 2000..... 5
NONE - VOLUNTEERED..... 6
DK..... 8
NA..... 9

S15. In the following two questions, when I say "your company," I am referring to those divisions, plants, or subsidiaries in (TARGET AREA) that were reported by your company, in the previous interview, to employ _____ employees in December, 1979 and _____ employees in July, 1979.

S16. Does your company in (TARGET AREA) use independent contractors? 23

Yes..... 1
No..... 2
DK..... 8
NA..... 9

S17. How many employees both full and part-time did your company employ in (TARGET AREA) during the following periods. Do not include independent contractors. You may want to refer to the worksheet we sent you. How many are employed... (READ LIST)...

A. Currently ___ ___, ___ ___ ___ 24-28

RECORD NUMBER

Some, DK #..... 99996
None..... 99997
DK..... 99998
NA..... 99999

How many were employed:

B. The week of December 12, 1981? ___ ___, ___ ___ ___ 29-33

RECORD NUMBER

Some, DK#..... 99996
None..... 99997
DK..... 99998
NA..... 99999

C. The week of July 1, 1981? ___ ___, ___ ___ ___ 34-38

RECORD NUMBER

Some, DK#..... 99996
None..... 99997
DK..... 99998
NA..... 99999

D. The week of December 12, 1980? ___ ___, ___ ___ ___ 39-43

RECORD NUMBER

Some, DK#..... 99996
None..... 99997
DK..... 99998
NA..... 99999

E. The week of July 1, 1980? ___ ___, ___ ___ ___ 44-48

RECORD NUMBER

Some, DK#..... 99996
None..... 99997
DK..... 99998
NA..... 99999

S18. Approximately what percentage of your workforce is under 25 years of age?

___ ___ ___ %
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999
49-51

S19. Two years ago approximately what percentage of your workforce was under 25 years of age?

___ ___ ___ %
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999
52-54

S20. Has there been any change since 1979 in the percentage of your non-supervisory workers that are covered by collective bargaining agreements?

Yes.....(ASK S21)..... 1
No.....(GO TO S22)... 2
DK....(ASK S21)..... 8
NA....(ASK S21)..... 9
55

S21. What is the current percentage of your non-supervisory workers that are covered by collective bargaining?

___ ___ ___ %
RECORD NUMBER
DK..... 998
NA..... 999
56-58

S22. By what percent did the average hourly wage rate of non-supervisory workers increase in the 2-year period between December 1979 and December 1981?

___ ___ ___ %
% INCREASE
Decrease-Volunteered 996
No Change..... 997
DK..... 998
NA..... 999
59-61

S23. After adjusting for price changes in your product, were your unit sales in 1981 higher, lower or about the same as in 1979?

Higher....(ASK S24)... 1
Lower.....(ASK S24)... 2
Same.....(GO TO 101). 3
DK.....(GO TO 101). 8
NA.....(GO TO 101). 9
62

S24. Again adjusting for price increases, approximately what was the percentage change?

___ ___ ___ %
RECORD %
Some, DK#.....997
DK.....998
NA.....999
63-65

78

COLS 66-78-81
COL 79-80=04
S6

C.5 1-bl NEW ID: 2-5
OLD ID: 6-13 14-38bl

FINAL

Date: _____

Time started _____
Time ended _____
Length _____ 39-41

GO 8213

PART A: Past Ten Day and One Year Experience

* This first series of questions concerns information on general hiring practices. You may want to refer to the worksheet sent you in the last two weeks.

101. Generally speaking how difficult or easy would you say it is to find reliable unskilled workers at "reasonable" wages in your location? (READ LIST)...

Very difficult..... 1
Somewhat difficult,..... 2
Not very difficult, or.... 3 42
Easy..... 4
DK..... 8
NA..... 9

102. How much do you agree with the following statement: As much as possible I try to avoid having to deal with government bureaucrats. (READ LIST)...

Strongly agree..... 1
Somewhat agree.....2
Strongly disagree, or...3 43
Somewhat disagree with that statement.. 4
DK..... 8
NA..... 9

103. The next series of questions refers to the last ten workdays. During the last 10 working days, has your organization (READ LIST)...

		Yes	No	DK	NA	
A.	Asked for any referrals from Job Service?	1	2	8	9	44
B.	Asked for referrals from a union or an employment agency?	1	2	8	9	45
C.	Advertised any jobs in the paper?	1	2	8	9	46
D.	Displayed a help wanted sign?	1	2	8	9	47
E.	Announced to current employees that vacancies were expected?	1	2	8	9	48
F.	Made any other effort to attract job applicants (IF YES, SPECIFY _____ _____	1	2	8	9	49

79

104. During the past ten days, how many telephone calls did you and your personnel office receive from people seeking work? Do not include calls from employment agencies.

(ASK 105) ___ ___ ___ 50-52
RECORD NUMBER
Some, but DK# (ASK 105) 996
None (GO TO 106)..... 997
DK (ASK 105)..... 998
NA (ASK 105)..... 999

105. How were these callers generally treated? Were they encouraged to come in to fill out a job application, encouraged to fill out a job application only if they had skills related to a job opening, or generally discouraged not to come in to fill out an application?

Generally encouraged.. 1 53
Encouraged if skills..... 2
Discouraged..... 3
NEITHER..... 4
DK..... 8
NA..... 9

106. During the past ten days, about how many people came to your company looking for work? (IF DK PROBE: Just your best guess.)

(ASK 107) ___, ___ ___ ___ 54-57
RECORD NUMBER
Some, DK# (ASK 107) 9996
None (GO TO 108)... 9997
DK (GO TO 108).. 9998
NA (GO TO 108).. 9999

107. How many people filled out an application? (IF DK PROBE: Just your best guess.)

___, ___ ___ ___ 58-61
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

108. How many people were interviewed? (IF DK PROBE: Just your best guess.)

(ASK 109) ___, ___ ___ ___ 62-65
RECORD NUMBER
Some, DK# (ASK 109) 9996
None (GO TO 110)... 9997
DK (ASK 109)..... 9998
NA (ASK 109)..... 9999

2

80

109. Of those interviewed, how many did you call in based on information you obtained from a previously filed written application? (IF DK PROBE: Just your best guess.)

66-68

___ ___ ___
RECORD NUMBER
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999

110. During the last 10 working days, how many job offers did you make?

69-71

___ ___ ___
RECORD NUMBER
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999

111. Ten working days ago, how many vacancies did you have that you wanted to fill immediately with a new employee? (IF DK PROBE: Just your best guess.)

72-75

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

"VACANCIES" EXCLUDE:

- JOBS FILLED BY RECALL, TRANSFER, PROMOTION, DEMOTION OR RETURN FROM LEAVE
- JOBS UNOCCUPIED BECAUSE OF LABOR MANAGEMENT DISPUTES — 76-78-81
- JOB OPENINGS FOR WHICH "NEW" WORKERS WERE ALREADY HIRED AND SCHEDULED TO WORK LATER — 79-80-05
- JOB OPENINGS WITH FUTURE STARTING DATES

C 6
1=81
NEW ID: 2-5

112. Today, how many vacancies for new employees do you have that you want to fill immediately? (IF DK PROBE: Just your best guess.)

6-8

___ ___ ___
RECORD NUMBER
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999

3

113. Then... how many job openings with future starting dates for new employees do you have? (IF DK PROBE: Just your best guess. Q.112 REFERS TO PRESENT VACANCIES. Q.113 REFERS TO FUTURE EXPECTED VACANCIES).

___ ___ ___ 9-11
RECORD NUMBER
Some, DK#.....996
None.....997
DK.....998
NA.....999

113A. The next series of questions refer to all of 1981.

114. Were any permanent or temporary employees fired during 1981? By fired we mean a termination initiated by the employer for reasons such as incompetence, absenteeism, or insubordination.

Yes..... (ASK 115)..... 1 12
No.....(GO TO 116)... 2
DK.....(GO TO 116)... 8
NA.....(GO TO 116)... 9

115. Approximately how many employees were fired? (IF DK PROBE: Just your best guess.)

___, ___ ___ ___ 13-16
RECORD NUMBER
Some, DK#..... 9996
DK..... 9998
NA..... 9999

116. Did any permanent or temporary employees quit during 1981?

Yes..... (ASK 117)..... 1 17
No.....(GO TO 118)... 2
DK..(GO TO 118)..... 8
NA..(GO TO 118)..... 9

BY QUIT WE MEAN SEPARATIONS INITIATED BY THE EMPLOYEE FOR ANY REASON EXCEPT:

- -RETIREMENT
- -DEATH
- -TRANSFER TO ANOTHER ESTABLISHMENT IN YOUR COMPANY
- - SERVICE IN THE ARMED FORCES

117. Approximately how many employees quit during 1981? (IF DK PROBE: Just your best guess.)

18-21

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
DK..... 9998
NA..... 9999

118. How many of your current employees were newly hired by your company during 1981? Current employees are permanent, temporary or seasonal employees who have never before been employed by your company, and who are still working for your company. (IF DK PROBE: Just your best guess.)

22-25

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

119. How many employees were newly hired in 1981, but are no longer with your company? (IF DK PROBE: Just your best guess. SUM OF Q.118 AND Q.119 SHOULD EQUAL TOTAL NEW HIRES IN 1981).

26-29

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

PART B: LAST HIRED WORKER SECTION

30-36-01

I'd like to ask you to think of the last new employee your company hired prior to August 1981 regardless of whether that person is still employed by your company. I'm going to ask you some questions about that person and the position he or she was hired to fill.

201. To make it easier to refer to him or her during the interview, please give me his or her first name and sex.

_____

Male..... 1
Female..... 2
DK..... 8
NA..... 9

37

202A. What was the title of the job (NAME) was hired for? (PROBE FOR DETAIL)
(RECORD RESPONSE BELOW UNDER Q 202B - TITLE)

202B. What are the most important duties of the job? PROBE FOR SPECIFIC TYPE OF PRODUCT WORKED ON OR WITH.

TITLE: _____

DUTIES: _____

_____

_____

37-45

202C. What kind of company or business is (NAME OF COMPANY)?

_____

DK..... 999999998
NA..... 999999999

203. Before a new employee starts work in this position, does your company require a complete pre-employment physical paid for by the company?

Yes..... 1
No..... 2
DK..... 8
NA..... 9

46

204. When interviewing applicants for this position, how important is the previous school-provided vocational training in your hiring decision? (READ LIST)...

It is required..... 1
It's important, but not required..... 2
Not too important..... 3
Not important at all..... 4
DK..... 8
NA..... 9

47

205. In the first three months of employment, approximately how many total hours does a typical new employee in NAME'S position spend away from normal work activities filling out forms and being told about the company history, benefits and rules? 48-49

___ ___
RECORD HOURS
NONE..... 97
DK..... 98
NA..... 99

206. During the first three months, how many total hours does the average new employee spend in training activities in which he or she is watching other people do the job rather than doing it himself? 50-52

___ ___ ___
RECORD HOURS
NONE..... 997
DK..... 998
NA..... 999

207. How many weeks does it take a new employee hired for this position to become fully trained and qualified if he or she has no previous experience in this job, but has had the necessary school-provided training? 53-55

___ ___ ___
RECORD WEEKS
NONE..... 997
DK..... 998
NA..... 999

208. How many of the skills learned by new employees in this job are useful outside of this company? (READ LIST)... 56

Almost all..... 1
Most..... 2
Some..... 3
Or almost none..... 4
DK..... 8
NA..... 9

209. Focusing on the skills that are useful outside your company, how many other companies in the local labor market have jobs that require these skills? Would you guess (READ LIST)... 57

less than 5..... 1
5 to 15..... 2
16 to 100..... 3
or over 100..... 4
DK..... 8
NA..... 9

210. Does this job have a probationary period during which the new employee can be let go without too much trouble if he or she is not performing up to standard?

Yes (ASK 211)..... 1
No (GO TO 212)..... 2
DK (GO TO 212). 8
NA (GO TO 212). 9

58

211. How many weeks does the probationary period last?

__ __
WEEKS
DK..... 98
NA..... 99

59-60

212. (IF YES IN Q.210 READ: After the probationary period is over). How much documentation or paperwork is required to fire an employee? (READ LIST)

A great deal..... 1
Some..... 2
A little..... 3
No paperwork..... 4
DK..... 8
NA..... 9

61

213. For people in this position what is the basis for promotion? (READ LIST)...

Solely Seniority..... 1
Mainly Seniority..... 2
Mainly Ability..... 3
Or some of both..... 4
NO PROMOTION OPPORTUNITY(VOLUNTEERED).. 5
DK..... 8
NA..... 9

62

214A. If your company were to permanently lay off one third of its employees in (NAME'S) position, what would be the basis for selecting which employees would be laid off? Would it be: (READ LIST)

Solely Seniority (GO TO 215A)... 1
Mainly Seniority (GO TO 215A)... 2
Mainly Productivity (GO TO 215A) 3
SOME OF BOTH (GO TO 215A)..... 4
DOWN GRADE (ASK 214B)..... 5
OTHER (SPECIFY)
(ASK 214B)_____ 6
ONLY ONE WORKER (GO TO 215A).... 7
DK (GO TO 215A)..... 8
NA (GO TO 215A)..... 9

63

3

214B. What would be the basis for deciding (who to demote/others response?)

Solely Seniority..... 1 70
Mainly Seniority..... 2
Mainly Productivity..... 3
SOME OF BOTH..... 4
SOME OTHER BASIS
SPECIFY _____ 5
DK..... 8
NA..... 9

215A. If your company were to temporarily lay off one third of its employees in (NAME'S) position for a period of only 3 months, what would be the basis for selecting which employees would be laid off? Would it be: (READ LIST)...

Solely Seniority (GO TO 216).. 1 71
Mainly Seniority (GO TO 216).. 2
Mainly Productivity (GO TO 216) 3
SOME OF BOTH.....(GO TO 216).. 4
DEMOTIONS.....ASK 215B).... 5
SOME OTHER BASIS
SPECIFY (ASK 215B) _____ 6
ONLY ONE WORKER (GO TO 216)... 7
DK.....(GO TO 216)... 8
NA.....(GO TO 216)... 9

215B. What would be the basis for deciding (who to demote/other response?)

Solely Seniority..... 1 72
Mainly Seniority..... 2
Mainly Productivity..... 3
SOME OF BOTH..... 4
SOME OTHER BASIS
SPECIFY _____ 5
DK..... 8
NA..... 9

216. After a three month layoff, approximately what percent of laid off employees do you think either could not be traceable or would refuse to return? (READ LIST)...

0-10%..... 1 73
11-30%..... 2
31-60%..... 3
61-100%..... 4
DK..... 8
NA..... 9

217. If it were purchased today, what would be the cost of the most expensive machine people in (NAME'S) position work on or with? (READ LIST)...

Under $2,000..... 1 74
$2-$10,000..... 2
$10,000-$50,000..... 3
$50-$200,000..... 4 75-78-b1
$200,000 UP..... 5 COL 79=80=0
DK..... 8 9
NA..... 9

C.2
1=b1
NEW ID: 2-5

218. In what month and year did (NAME) begin working for your company?

__ __ - 1 9 __ __ 6-11
MONTH YEAR
DK..... 989998
NA..... 999999

219. Approximately how many days was it between the time you started looking for someone to fill the opening and the time (NAME) started to work?

__ __ __ 12-14
DAYS
Always looking..... 996
NONE/Did not have to look.. 997
DK..... 998
NA..... 999

220A. Did you have any advance notice of the existence of this opening?

Yes...(ASK 220B).... 1 COL 15
No....(GO TO 221)... 2
DK..(GO TO 221)... 8
NA..(GO TO 221)... 9

220B. Approximately how many days before you needed a new employee for (NAME'S) position did you begin to look for one?

__ __ 16-17
RECORD DAYS
Some, DK#..... 96
NONE..... 97
DK..... 98
NA..... 99

221. How many openings did you have for this position during the period when you were hiring (NAME)?

__, __ __ __ 18-21
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

222. How many people applied for this position?

__, __ __ __ 22-25
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

223. How many applicants were reference-checked with a previous employer?

__, __ __ __ 26-29
RECORD NUMBER
First job..... 9995
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

224. How many applicants were interviewed for this position? 30-33

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

225A. To how many of these applicants did you offer a job? (ANSWER SHOULD NOT BE NONE) 34-36

___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
DK..... 9998
NA..... 9999

225B. How many of these applicants accepted a job? (ANSWER SHOULD NOT BE NONE) 37-40

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
DK..... 9998
NA..... 9999

225C. How many of those interviewed had applied prior to this job-opening and were called in for an interview when the vacancy arose? 41-44

___, ___ ___ ___
RECORD NUMBER
Some, DK#..... 9996
None..... 9997
DK..... 9998
NA..... 9999

226. While hiring for this position, what was the total number of man hours spent by your company personnel recruiting, screening, and interviewing all applicants? 45-47

___ ___ ___
RECORD HOURS
Some, DK#..... 996
None..... 997
DK..... 998
NA..... 999

11

48-51

227. What was (NAME'S) age at the time (he/she) was hired? — — 49-50

AGE

DK..... 98

NA..... 99

228. What was the last year of grade school, high school, or college (NAME) completed? — — 51-52

RECORD NUMBER

DK..... 98

NA..... 99

PROBE FOR ACTUAL NUMBER.

IF ONLY THE FOLLOWING ANSWERS ARE GIVEN, RECORD THE CORRESPONDING NUMBER:

(COMPLETE) GRAMMAR SCHOOL	-08	COMPLETED COLLEGE	-16
INCOMPLETE HIGH SCHOOL	-10	GRADUATE SCHOOL INCOMPLETE	-17
COMPLETE HIGH SCHOOL	-12	MASTERS/LAW/MBA	-18
INCOMPLETE COLLEGE	-14	PH.D/MD/DDS	-20

229. Was (NAME) in the military in last 5 years? 53

NOTE: THIS DOES NOT INCLUDE MILITARY RESERVES.

Yes.... (ASK 230)..... 1

No....(GO TO 233).. 2

DK (GO TO 233)..... 8

NA (GO TO 233)..... 9

230. Which service was (NAME) in? 54

Army..... 1

Air force..... 2

Navy..... 3

Marines..... 4

Other(SPECIFY)_____ 5

DK..... 8

NA..... 9

231. How many years was (he/she) in the military? — — 55-56

RECORD YEARS

Some, DK#..... 96

DK..... 98

NA..... 99

232. What was (his/her) job at the end of (his/her) military service? 57-60

_____
JOB TITLE

DK..... 9998

NA..... 9999

233. Prior to being hired, did (NAME) receive any vocational training in a school setting? 61

Yes.... (ASK 234A)..... 1

No..... (GO TO 235)..... 2

DK. (GO TO 235)..... 8

NA. (GO TO 235)..... 9

234A. What was the name of the most recent institution where (NAME) received (his/her) vocational training prior to being hired? Please tell me the formal name of the institution and whether it was a high school, junior college, vocational-technical school, or a 4 year college.

(RECORD NAME) _____

PICK UP NAME: ALPHA
C. 08
1-b1
NEW ID: 2-5 DK=8 in Col. 6
NAME: 6-78
79-80=08

	High School..... 1	62
	Junior College..... 2	
	Vocational-technical school..... 3	
	4 year college..... 4	
	DK..... 8	
	NA..... 9	
234B. Was this a public or private school?	Public..... 1	63
	Private..... 2	
	DK..... 8	
	NA..... 9	
234C. Did the vocational training course in (NAME OF SCHOOL) last less than 1 year, 1 year, 2 years, or more then 2 years? (IF CURRENTLY A STUDENT, ASK: How long had (NAME) been in a training course prior to starting here?)	less than 1 year..... 1	64
	1 year..... 2	
	2 year..... 3	
	2 year +..... 4	
	DK..... 8	
	NA..... 9	
234D. What year was the training at (NAME OF SCHOOL) completed?	19 ___ ___	65-66
	RECORD YEAR	
	STILL STUDENT..... 96	
	DK..... 98	
	NA..... 99	
234E. How related was the vocational training at (NAME OF SCHOOL) to the job for which (NAME) was hired? (READ LIST)...	Very (GO TO 244)..... 1	67
	Somewhat, or(GO TO 244) 2	
	Not at all(GO TO 244).. 3	
	DK....(GO TO 244)..... 8	
	NA....(GO TO 244)..... 9	

Q244 IS ON PAGE 18

68-78-b1
79-80=07

C.9
1=bl
NEW ID: 2-5

235. The purpose of the following questions is to compare (NAME 1) with another employee you hired for the same or similiar position, but with some prior vocational training in a school setting.

Please tell me the first name and sex of the last person you hired within the past 2 years for (NAME'S) position who received any vocational training in a school setting.

_____
NAME 2

6

Male..... 1
Female..... 2
None hired in past 2 years with training
(GO TO Q251A) 3
None else hired
(GO TO Q251A).....4
DK (GO TO Q251A)..... 8
NA (GO TO Q251A)..... 9

Q.251A IS ON PAGE 20

236. In what month and year did (NAME 2) begin working for your company?

__ __ - 1 9 __ __ 7-12
MONTH YEAR
DK..... 989998
NA..... 999999

237. What was (NAME 2'S) age at the time he/she was hired?

__ __ 13-14
AGE
DK..... 98
NA..... 99

238. What was the last year of school, (NAME 2) completed? (PROBE FOR ACTUAL NUMBER. IF ONLY THE FOLLOWING ANSWERS ARE GIVEN, RECORD THE CORRESPONDING NUMBER:

__ __ 15-16
RECORD NUMBER
DK..... 98
NA..... 99

(COMPLETE) GRAMMAR SCHOOL	-08
INCOMPLETE HIGH SCHOOL	-10
COMPLETE HIGH SCHOOL	-12
INCOMPLETE COLLEGE	-14
COMPLETED COLLEGE	-16
GRADUATE SCHOOL/INCOMPLETE	-17
MASTERS/LAW/MBA/	-18
PH.D/DDS/MD	-20

239. Was (NAME 2) in the military in the past 5 years?

Yes.... (ASK 240)..... 1
No..... (GO TO 243)..... 2
DK (GO TO 243)..8
NA (GO TO 243)..9

17

240. Which service was (NAME 2) in?

Army..... 1
Air force..... 2
Navy..... 3
Marines..... 4
Other(SPECIFY)_____ 5
DK..... 8
NA..... 9

18

241. How many years was (he/she) in the military?

___ ___
RECORD YEARS
Some, DK#..... 96
DK..... 98
NA..... 99

19-20

242. What was (his/her) job at the end of (his/her) military service?

_____
JOB TITLE
DK..... 9998
NA..... 9999

21-24

243A. What was the name of the most recent institution where (NAME 2) received (his/her) vocational training prior to being hired? Please tell me the formal name of the institution and whether it was a high school, junior college, vocational-technical school, or a 4 year college.

(RECORD NAME) _____

PICK UP NAME: ALPHA
C.10
1-b1
NEW ID: 2-5 DK=8 in
NAME: 6-78 Col. 6
79-80 = 10

High School..... 1 *25*
Junior College..... 2
Vocational-technical school..... 3
4 year college..... 4
DK..... 8
NA..... 9

243B. Was this a public or private school?

Public..... 1 *26*
Private..... 2
DK..... 8
NA..... 9

243C. Did the vocational training course in (NAME OF SCHOOL) last less than 1 year, 1 year, 2 years, or more then 2 years? (IF CURRENTLY A STUDENT ASK: How long had (NAME) been in a training course prior to starting here?)

less than 1 year..... 1 *27*
1 year..... 2
2 year..... 3
2 year +..... 4
DK..... 8
NA..... 9

243D. What year was the training at (NAME OF SCHOOL) completed?

19 __ __ *28-29*
RECORD YEAR
STILL A STUDENT... 96
DK..... 98
NA..... 99

243E. How related was the vocational training at (NAME OF SCHOOL) to the job for which (NAME 2) was hired? (READ LIST)...

Very (GO TO 251A).....1 *30*
Somewhat, or (GO TO 251A)..2
Not at all (GO TO 251A)..3
DK (GO TO 251A).....8
NA (GO TO 251A).....9

GO TO 251A PAGE 20 GO TO 251A PAGE 20 GO TO 251A PAGE 20

244. The purpose of the following questions is to compare (NAME 1) with another employe you hired for the same or similiar position, but with no prior vocational training in a school setting.

Please tell me the first name and sex of the last person you hired within the past 2 years for (NAME 1's) position who received no vocational training in a school setting.

_____
NAME 2

Male..... 1 *31*
Female..... 2
None hired in past 2 years with no vocational training (GO TO 251A) 3
None else hired (GO TO 251A)..... 4
DK..... 8
NA..... 9

245. In what month and year did (NAME 2) begin working for your company?

__ __ - 1 9 __ __ *32-37*
MONTH YEAR
DK..... 989998
NA..... 999999

246. What was (NAME 2'S) age at the time he/she was hired?

__ __ *38-39*
AGE
DK..... 98
NA..... 99

247. What was the last year of grade school, high school, or college (NAME 2) completed?

__ __ *40-41*
RECORD NUMBER
DK..... 98
NA..... 99

(COMPLETE) GRAMMAR SCHOOL	-08
INCOMPLETE HIGH SCHOOL	-10
COMPLETE HIGH SCHOOL	-12
INCOMPLETE COLLEGE	-14
COMPLETED COLLEGE	-16
GRADUATE SCHOOL/INCOMPLETE	-17
MASTERS/LAW/MBA/	-18
PH.D/DDS/MD	-20

248. Was (NAME 2) in the military in the past five years?

Yes.... (ASK 249)..... 1 *42*
No..... (GO TO 251A).2
DK (GO TO 251A)..... 8
NA (GO TO 251A)..... 9

249. Which service was (NAME 2) in?

Army..... 1 *43*
Air force..... 2
Navy..... 3
Marines..... 4
Other(SPECIFY)_____ 5
DK..... 8
NA..... 9

250. How many years was (he/she) in the military?

___ ___ *44-45*
RECORD YEARS
Some, DK#..... 96
DK..... 98
NA..... 99

251. What was (his/her) job at the end of (his/her) military service?

_____ *46-43*
JOB TITLE
DK..... 9998
NA..... 9999

251A. FOR THE FOLLOWING QUESTIONS, ASK EACH QUESTION FOR NAME 1 AND THEN NAME 2. IF NO NAME 2 IDENTIFIED, ASK QUESTIONS FOR NAME 1 ONLY.

	NAME 1	NAME 2
		50/51
252. Was (NAME) a friend or relative of a current employee, a walk-in, a respondent to a newpaper ad, or a referral?	Friend (GO TO 254)..... 1 Relative (GO TO 254)..... 2 Walk-in (GO TO 254)..... 3 Newspaper Ad (GO TO 254)..... 4 Referral(253).. 5 DK(GO TO 254).8 NA(GO TO 254).9	Friend (GO TO 254)..... 1 Relative (GO TO 254)..... 2 Walk-in (GO TO 254)..... 3 Newspaper Ad (GO TO 254)..... 4 Referral(253).. 5 DK(GO TO 254).8 NA(GO TO 254).9
		52-53/54-55
253. What was the source of the referral? (DO NOT READ LIST)	Emp. Service....01 Private Emp. Agency..... 02 CETA..... 03 Win/Welfare.....04 Community Based Org. (i.e., Urban League..... 05 Other Employer 06 School..... 07 Union..... 08 Friend.....09 Relative.....10 Other (SPECIFY) _____ 11 DK.....98 NA.....99	Emp. Service....01 Private Emp. Agency..... 02 CETA..... 03 Win/Welfare.....04 Community Based Org. (i.e., Urban League.....05 Other Employer 06 School.....07 Union.....08 Friend.....09 Relative.....10 Other (SPECIFY) _____ 11 DK.....98 NA.....99

	NAME 1	NAME 2	
254. How many months of experience in jobs that had some application to the position did (NAME) have before (he/she) started working for your company?	___ ___ ___ RECORD MONTHS Some, DK#....996 None.....997 DK.....998 NA.....999	___ ___ ___ RECORD MONTHS Some, DK#....996 None.....997 DK.....998 NA.....999	56-58/59-61
255. Was the job supposed to be temporary, seasonal or permanent when you you hired (him/her)?	Temporary.....1 Seasonal.....2 Permanent.....3 DK.....8 NA.....9	Temporary.....1 Seasonal.....2 Permanent.....3 DK.....8 NA.....9	62/63
256. Is (NAME) still with your company?	Yes (GO TO 258A) 1 No (ASK 257)..... 2 DK (ASK 257).....8 NA (ASK 257).....9	Yes (GO TO 258A) 1 No (ASK 257).. 2 DK (ASK 257)..... 8 DK (ASK 257)..... 9	64/65
257. How many weeks did (NAME) work for your company? (RECORD ON CHIT SHEET)	___ ___ RECORD WEEKS DK.....98 NA.....99	___ ___ RECORD WEEKS DK.....98 NA.....99	66-67/68-69

		NAME 1:	NAME 2:
257A.	Was (NAME'S) separation a layoff, a discharge, an induced resignation, or a voluntary resignation? (PEOPLE ARE "INDUCED TO RESIGN" PRIMARILY BECAUSE THEY WOULD BE DISCHARGED OR BECAUSE SUPERVISORS HAD EXPRESSED DISSATISFACTION WITH THEIR PERFORMANCE.)	Layoff..... 1 Discharge..... 2 Induced Resignation..... 3 Voluntary Resignation..... 4 Other..... 5 DK..... 8 NA..... 9	Layoff..... 1 Discharge..... 2 Induced Resignation..... 3 Voluntary Resignation..... 4 Other..... 5 DK..... 8 NA..... 9

70/71

258A. The following questions ask about employee earnings. If possible, please give earnings in hourly terms.

258B.	Is (NAME 1's) job paid (READ LIST)	Hourly (GO TO 259)..... 1 By salary (GO TO 259)..... 2 100% commission (GO TO 259)..... 3 Piece rate (GO TO 259)..... 4 Straight time or salary plus tips, incentives and commissions (ASK 258C)..... 5 DK (GO TO 259)..... 8 NA. (GO TO 259)..... 9
258C.	What type of incentive is offered (READ LIST)...	Commission..... 1 Tips..... 2 Group incentives..... 3 Individual incentives..... 4 DK..... 8 NA..... 9
259.	What is the average hourly rate paid to workers in (NAME 1's) position who have had 2 years of experience in this job? Please include any commissions, bonuses or incentive pay in your estimate.	$___ ___ . __ __ DOLLARS CENTS DK..... 9998 NA..... 9999

72

73

74-78=bl
79-80=09
c.11
1-bl.
NEW ID: 2-5
6-9

	NAME 1	NAME 2	
260. What was (NAME'S) starting hourly rate including commissions, and incentive pay?	(GO TO 263) $__ __ . __ __ DOLLARS CENTS DK(ASK 261)..9998 NA(GO TO 263)9999	(GO TO 263) $__ __ . __ __ DOLLARS CENTS DK(ASK 261)9998 NA(GO TO 263)9999	10-13/14-17
261. What was (NAME'S) usual monthly salary including commissions and incentive pay when (he/she) started work? (RECORD IN WHOLE DOLLARS, IF (NAME) WORKS LESS THAN 1 YEAR BASE SALARY ON NUMBER MONTHS WORKED.)	$ __ __ , __ __ __ DOLLARS DK..... 99998 NA..... 99999	$ __ __ , __ __ __ DOLLARS DK..... 99998 NA..... 99999	18-22/23-27
262. How many hours did (NAME) usually work a week?	__ __ HOURS DK..... 98 NA..... 99	__ __ HOURS DK..... 98 NA..... 99	28-29/30-31
263. What is NAME'S current hourly wage including commissions and incentive pay? (EVEN IF NAME HAS LEFT CO.)	(GO TO 265) __ __ . __ __ DOLLARS CENTS DK(ASK 264)..9998 NA(GO TO 265)9999	(GO TO 265) $__ __ . __ __ DOLLARS CENTS DK(ASK 264)9998 NA(GO TO 265)9999	32-35/36-39

OR, IF (NAME) HAS LEFT COMPANY READ:
What was NAME'S hourly wage including tips, commissions and incentive pay when he/she left your company. (RECORD RESPONSE, THEN SKIP TO 265.)

264. What is (NAME's) current monthly salary, including tips, commissions and incentive pay? (IF NAME HAS LEFT COMPANY, ASK: What was NAME'S monthly salary when he left the company?)	__ __ , __ __ __ DOLLARS DK.....99998 NA.....99999	__ __ , __ __ __ DOLLARS DK.....99998 NA.....99999	40-44/45-49

		NAME 1	NAME 2	
265.	How many hours does/did (NAME) usually work a week?	__ __ HOURS DK..... 98 NA..... 99	__ __ HOURS DK..... 98 NA..... 99	50-51/52-53
266.	Has (NAME) received a promotion, or an upgrading of (his/her) job responsibilities since being hired?	Yes (ASK 267)..... 1 No (GO TO 268)..... 2 DK (GO TO 268)..... 8 NA (GO TO 268)..... 9	Yes (ASK 267)..... 1 No (GO TO 268)..... 2 DK (GO TO 268)..... 8 NA (GO TO 268)..... 9	54/55
267.	Approximately how many months after being hired did (he/she) receive the promotion?	__ __ __ RECORD MONTHS DK..... 998 NA..... 999	__ __ __ RECORD MONTHS DK..... 998 NA..... 999	56-58/59-61
268.	Have you received or do you expect to receive a tax credit or government reimbursement of part of your training costs for hiring (NAME)?	Yes(GO TO 269)..... 1 No (GO TO 271A)..... 2 DK (GO TO 271A).. 8 NA (GO TO 271A).. 9	Yes(GO TO 269)..... 1 No (GO TO 271A).... 2 DK (GO TO 271A).. 8 NA (GO TO 271A).. 9	62/63
269.	Did you know you would be eligible for this at the time you hired (NAME)?	Yes(GO TO 271)..... 1 No (ASK 270)..... 2 DK (GO TO 271).. 8 NA (GO TO 271).. 9	Yes(GO TO 271).. 1 No (ASK 270)..... 2 DK (GO TO 271).. 8 NA (GO TO 271).. 9	64/65

66-72/72-77

270. When did you learn (NAME) was eligible?

___ ___ - 19 ___ ___	___ ___ - 19 ___ ___
MO YR	MO YR
DK.....999998	DK..... 999998
NA.....999999	NA..... 999999

78 = bl
79 = 1
80 = 1
C. 12
1-bl
NEW ID: 2-5

271. From which program is the money coming?

TJTC.....1	TJTC..... 1
WIN Tax Credit..2	WIN Tax Credit.. 2
CETA-OJT.....3	CETA-OJT..... 3
WIN-OJT.....4	WIN-OJT..... 4
Other Government Subsidy	Other Government Subsidy
SPECIFY_____5	SPECIFY_____5
DK....8	DK..... 8
NA....9	NA..... 9

6/7

271A. The questions in this section ask about worker training and supervision for NAME'S position.

Once we get started if you find it is necessary for me to talk to a supervisor for that position please transfer me to him/her at the end of this interview.

271B. IF YOU MUST SPEAK TO A SUPERVISOR ASK SECTIONS "C" AND "D". ASK FOR SUPERVISOR AT END OF INTERVIEW. ASK 271C - 284.

271C. Is there formal training, such as self-paced learning programs or training done by specially trained personnel, for people hired in NAME's position, or is all the training done as informal on the job training?

Formal training . . .ASK 272 . . .1
All informal . . . GO TO 273 . . .2 8
DK . . . . . .ASK 272. 8
NA . . . . . .ASK 272. 9

272. For the following questions we ask comparisons among NAMES 1 and 2 and your typical new employee in the same position.

During the first 3 months of work what was the total number of hours spent on formal training such as self-paced learning programs or training done by specially trained personnel, of . . .

A. Your typical worker in (NAME'S) position. 9-11

___ ___ ___
RECORD HOUR
Some, DK#.....996
None.....997
DK..... 998
NA..... 999

B. NAME 1 (RECORD VERBATIM IF NOT IN HOURS; DO CONVERSION IF CLEAR) 12-14

___ ___ ___
RECORD HOUR
Some, DK#.....996
None.....997
DK..... 998
NA..... 999

C. NAME 2 (RECORD VERBATIM IF NOT IN HOURS; DO CONVERSION IF CLEAR) 15-17

___ ___ ___
RECORD HOUR
Some, DK#.....996
None.....997
DK..... 998
NA..... 999

INTERVIEWER NOTE: IF RESPONDENT ANSWERS QUESTION 272A, B or C IN TERMS OF DAYS, WEEKS OR MONTHS READ: You mean NAME received training 8 hours a day for _____days/weeks/months?

273. IF NOT ALREADY READ, READ:

In the following questions I am going to ask for comparisons among NAMES 1 and 2 and <u>your</u> typical new employee in the same position.

Now switching to informal training during their first 3 months of work, what was the <u>total</u> number of hours management and line supervisors spent away from other activities giving <u>informal</u> individualized training or extra supervision to:

A. Your typical worker in (NAME'S) position. — — — *18-20*

RECORD HOUR
Some, DK#.....996
None.....997
DK.....998
NA.....999

B. NAME 1 (IF NOT THERE FOR 3 MONTHS ASK: For the period he/she was there how many hours of informal training did he/she receive?) — — — *21-23*

RECORD HOUR
Some, DK#.....996
None.....997
DK.....998
NA.....999

C. NAME 2 (IF NOT THERE FOR 3 MONTHS ASK: For the period he/she was there, how many hours of informal training did he/she receive?) — — — *24-26*

RECORD HOUR
Some, DK#.....996
None.....997
DK.....998
NA.....999

INTERVIEWER NOTE: IF RESPONDENT ANSWERS QUESTION 273A, B, or C IN TERMS OF DAYS, WEEKS OR MONTHS READ: You mean NAME received training 8 hours a day for ____ days/weeks/months?

IF 273A, B <u>AND</u> C ARE DK ASK 274. OTHERWISE GO TO <u>277</u>.

274. How many different management and supervisory level persons give your typical employee in (NAME'S) position <u>informal</u> training?

27-28

— —
RECORD NUMBER
Some, DK#..... 96
DK..... 98
NA..... 99

275. About how many total days of informal training does the typical management level person spend informally training your typical new employee in (NAME'S) position?

29-30

— —
RECORD DAYS
Some, DK#..... 96
DK..... 98
NA..... 99

276. How many hours each day does the typical management person spend away from performing other duties in order to informally train a typical new employee?

31-32

— —
RECORD HOURS
Some, DK#..... 96
None..... 97
DK..... 98
NA..... 99

277. During the first 3 months of work what was the total number of hours co-workers who are not supervisors spent away from their normal work giving informal individualized training or extra supervision to:

A. Your typical worker in (NAME'S) position. 33-35

___ ___ ___
RECORD HOUR
Some, DK#..... 996
None..... 997
DK..... 998*
NA..... 999

B. NAME 1 (IF NOT THERE FOR 3 MONTHS ASK: For the period he/she was there how many hours of informal training did he/she receive?) 36-38

___ ___ ___
RECORD HOURS
Some, DK#..... 996
None..... 997
DK..... 998*
NA..... 999

C. NAME 2 (IF NOT THERE FOR 3 MONTHS ASK: For the period he/she was there how many hours of informal training did he/she receive?) 39-41

___ ___ ___
RECORD HOUR
Some, DK#..... 996
None..... 997
DK..... 998*
NA..... 999

INTERVIEWER NOTE: IF RESPONDENT ANSWERS QUESTION 277A, B or C IN TERMS OF DAYS, WEEKS OR MONTHS READ: You mean NAME received training 8 hours a day for ___days/weeks/months?

(*)

IF 277A, B AND C ARE ALL DK ASK 278. OTHERWISE GO TO 281.

278. How many different co-workers give your typical employee in (NAME'S) position <u>informal</u> training?

42-43

__ __
RECORD NUMBER
Some, DK#..... 96
None..... 97
DK..... 98
NA..... 99

279. About how many total days of informal training does the average co-worker spend on training your typical new employees in (NAME'S) position?

44-45

__ __
RECORD DAYS
Some, DK#..... 96
None..... 97
DK..... 98
NA..... 99

280. How many hours <u>each day</u> does the average co-worker spend away from performing other duties in order to informally train a typical new employee?

46-47

__ __
RECORD HOURS
Some, DK#..... 96
None..... 97
DK..... 98
NA..... 99

281. The last set of questions in this section asks about employee productivity.

Please rate your employee on a productivity scale of zero to 100, where 100 equals the maximum productivity rating any of your employees (NAME'S) position can attain and zero is absolutely no productivity by your employee.

48-50b1

282. What productivity score would you give your typical worker who has been in this job for 2 years? (PROBE FOR NUMBER)

___ ___ ___ *
RECORD NUMBER
DK..... 998
NA..... 999

51-53

283. Now, for each of the following time periods compare the productivity on this same scale of (NAME 1), (NAME 2) and your typical worker in this position. What is the productivity of (NAME/your typical worker) during (READ LIST) . . .

	NAME 1	NAME 2	TYPICAL WORKER	
A. (His/her) first 2 weeks of employment?	___ ___ ___ RECORD #	___ ___ ___ RECORD #	___ ___ ___ RECORD #	54-56/57-59/60-62
	NONE..997 DK..998 NA..999	NONE..997 DK..998 NA..999	NONE..997 DK..998 NA..999	
B. From (his/her) 3rd week to the 12 week at work? (IF NAME 1/ NAME 2 LEFT COMPANY BEFORE 12th WEEK - Q. 257 - DO NOT ASK Q. 283C)	___ ___ ___ ** RECORD # DK..998 NA..999	___ ___ ___ RECORD # DK..998 NA..999	___ ___ ___ * RECORD # DK..998 NA..999	63-65/66-68/69-71
C. (DO NOT ASK FOR TYPICAL WORKER) Today? OR, IF NAME NO LONGER WORKS FOR COMPANY READ: The last week NAME worked for your company?	___ ___ ___ ** RECORD # DK..998 NA..999	___ ___ ___ RECORD # DK..998 NA..999		72-74/75-77 78 31 79-80 =12

283A. IF TYPICAL WORKER - IS LESS PRODUCTIVE AFTER 2 YEARS (Q.282 IS LESS THAN Q. 283B, TYPICAL WORKER*) ASK 284. OTHERWISE GO TO 284A.

C.13
1 = 31.
New ID: 9-6

31

234. Why has the productivity of the typical worker declined?

_____ 6-7
_____ 8-9
_____ 10-11

234A. IF NAME 1 IS LESS PRODUCTIVE NOW THAN IN HIS/HER 3-12 WEEKS (Q. 233C IS LESS THAN Q. 233B**) ASK 235. ALL OTHERS GO TO SECTION "C".

235. Why has the productivity of NAME 1 declined?

_____ 12-13
_____ 14-15
_____ 16-17
_____
_____

	First Mention	Second Mention	Third Mention
Tried less hard (general)	10	10	10
Probationary period over	11	11	11
Because union protects the worker	12	12	12
Because other worker sets bad example	13	13	13
Because bored or frustrated with job	14	14	14
Personal or health problems	15	15	15
Learns how to get away with less	16	16	16
Because of conflict with co-workers	17	17	17
Conflict with supervisors	18	18	18
Not worker's fault (general)	20	20	20
Machine broke down	21	21	21
Poor training	22	22	22
Poor supervision or organization	23	23	23
Change of supervisor	24	24	24
Change of work group	25	25	25
Change in job assessment	26	26	26
Recession or bad luck	27	27	27
Health problem acts as limitation	28	28	28
Other _____	96	96	96
DK	98	98	98
NA	99	99	99

32

REFERENCES

REFERENCES

Becker, Gary. Human Capital. New York: Columbia University Press, 1975.

Berg, Ivar. Education and Jobs. Beacon Press, 1970.

Bishop, John H. "Queuing for Union Jobs and the Social Return to Schooling." Research in Labor Economics 2 (1978):75-107.

Bishop, John H. Subsidizing On-The-Job Training. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Brown, Charles. "Estimating the Determinants of Employee Performance." Journal of Human Resources 18, no. 2 (Spring 1982):178-194.

Campbell, Paul B. et. al. "Employment Experiences of Students with Varying Participation in Secondary Vocational Education: 1981." Report to the Office of Vocational and Adult Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, October 1981.

Cohn, Elcahanan. The Economics of Education. Cambridge, MA: Bollinger, 1979.

Cohn, Elchanan, and Hu, Teh-Wei. "Economies of Scale, By Program in Secondary Schools." The Journal of Educational Administration 6 (October 1973).

Daymont, Thomas, and Rumberger, Russell. "The Impact of High School Curriculum on the Earnings and Employability of Youth." Job Training for Youth, edited by Robert Taylor, Howard Rosen, and Frank Pratzner, pp. 279-306. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Foulkes, Fred. Personnel Policies in Large Non Union Companies. Englewood Cliffs, NJ: Prentice Hall, 1980.

Fredland, John Eric, and Little, Roger D. "Long Term Returns to Vocational Training Evidence from Military Sources." The Journal of Human Resources 15, no. 1 (1980):49-66.

Gustman, Alan, and Steinmeier, Thomas. "Labor Market Evaluations of Vocationtional Training Programs in the Public High Schools: Toward a Framework for Analysis." Southern Economic Journal, July 1982.

Hartman, Robert. "The Rationale for Federal Support for Higher Education." Does College Matter, edited by Lewis C. Solomon and Paul J. Toutman. New York, Academic Press, 1973.

Hashimoto, M. Miminum Wages and On-the-Job Training. Washington, DC: American Enterprise Institute, 1981.

Haveman, Robert, and Wolfe, Barbara. "Education and Economic Well Being: The Role of Non-Market Effects." Paper presented at ASSA meetings December 1982, Institute for Research on Poverty, University of Wisconsin, 1982.

Johnson, George E. "Allocative and Distributional Effects." Jobs for Disadvantaged Workers: The Economics of Employment Subsidies, edited by Robert H. Haveman and John L. Palmer, pp. 57-130. Washington, DC: The Brookings Institution, 1982.

Meyer, Robert H. "Job Training in the Schools." Job Training for Youth, edited by Robert E. Taylor, Howard Rosen, and Frank C. Pratzner, pp. 307-344. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Medoff, James L., and Abraham, Katharine G. "Are Those Paid More Really More Productive?" The Journal of Human Resources 16, no. 2 (1981):186-216.

Mundel, David. "Whose Education Shall Society Support?" Does College Matter? edited by Lewis C. Solomon and Paul J. Taubman. New York: Academic Press, 1973.

Okun, Arthur M. Prices and Quantities: A Macroeconomic Analysis. Washington, DC: The Brookings Institution, 1981.

Williamson, O.E.; Wachter, M.L.; and Harris, J.E. "Understanding the Employment Relation: The Analysis of Idiosyncratic Exchange." Bell Journal of Economics 6 (Spring 1975):250-278.